

# REPORT DOCUMENTATION PAGE

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1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE JUNE 1995	3. REPORT TYPE AND DATES COVERED Final Remedial Investigation	
4. TITLE AND SUBTITLE Installation Restoration Program Remedial Investigation Report Vol. III Alpena Combat Readiness Training Center Alpena MI			5. FUNDING NUMBERS PRTDVG957097	
6. AUTHOR(S) N/A				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) EARTH TECH Oak Ridge TN			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Hazardous Waste Remedial Actions Program Martin Marietta Energy Systems, Inc. Oak Ridge, TN 37831			10. SPONSORING / MONITORING AGENCY REPORT NUMBER RG-07-159-0370	
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12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			12b. DISTRIBUTION CODE	
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13. ABSTRACT (Maximum 200 words) Remedial Investigation Report of Sites 1-9 at Alpena CRTC, Alpena MI. Volume III Appendices A-I. A remedial investigation was performed on 9 sites at the Alpena CRTC to determine the extent of contamination at the sites. The sites involved in this investigation include: Site 1 POL Storage Area; Site 2 Motor Pool Area; Site 3 Former Garage; Site 4 Third Fire Training Area; Site 5 Second Fire Training Area; Site 6 Former Landfill; Site 7 First Fire Training Area; Site 8 Former Hanger 9; Site 10 Hazardous Waste Storage Area. Soil and groundwater contamination above state action levels was found at the sites. An FS has been initiated.				
DTIC QUALITY INSPECTED 5				
14. SUBJECT TERMS Installation Restoration Program; Air National Guard; Remedial Investigation; Alpena CRTC; Alpena MI, ANG			15. NUMBER OF PAGES 290	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCL.	18. SECURITY CLASSIFICATION OF THIS PAGE UNCL.	19. SECURITY CLASSIFICATION OF ABSTRACT UNCL.	20. LIMITATION OF ABSTRACT NONE	

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<b>C</b> - Contract	<b>PR</b> - Project
<b>G</b> - Grant	<b>TA</b> - Task
<b>PE</b> - Program Element	<b>WU</b> - Work Unit Accession No.

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**Block 10. Sponsoring/Monitoring Agency Report Number.** (If known)

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**Block 14. Subject Terms.** Keywords or phrases identifying major subjects in the report.

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# INSTALLATION RESTORATION PROGRAM

## FINAL REMEDIAL INVESTIGATION REPORT

### VOLUME III: APPENDICES A - I

ALPENA COMBAT READINESS TRAINING CENTER  
ALPENA COUNTY REGIONAL AIRPORT, MICHIGAN AIR NATIONAL GUARD  
ALPENA, MICHIGAN

JUNE 1995



450 01705661

**HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM**  
**Environmental Restoration and Waste Management Programs**  
Oak Ridge, Tennessee 37831-7606  
managed by MARTIN MARIETTA ENERGY SYSTEMS, INC.  
for the U.S. DEPARTMENT OF ENERGY under contract DE-AC05-84OR21400



**REMEDIAL INVESTIGATION REPORT  
ALPENA COMBAT READINESS TRAINING CENTER  
MICHIGAN AIR NATIONAL GUARD  
ALPENA, MICHIGAN**

Volume III

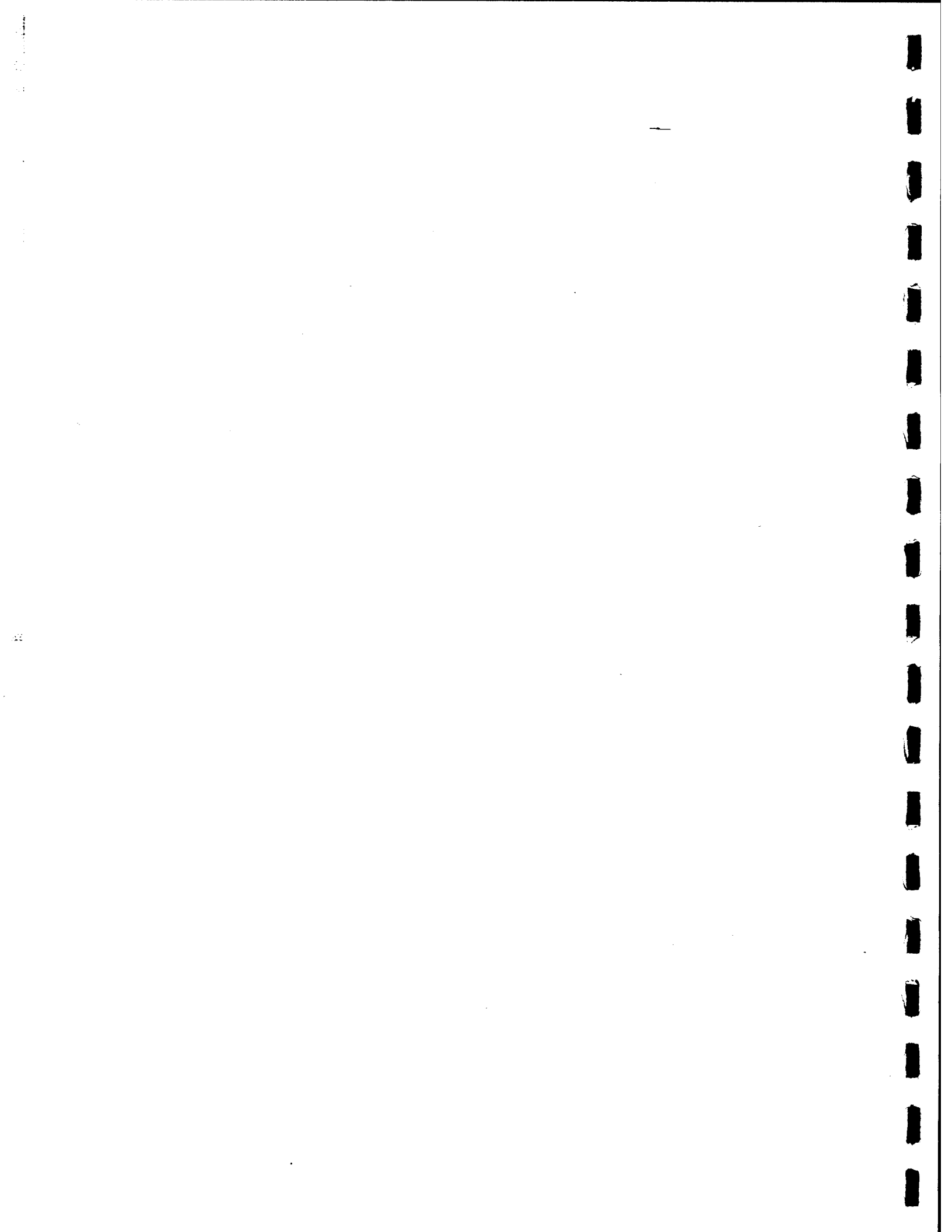
Appendix

- A Field Change Request Forms
- B Aquifer Testing Results
- C Soil Boring Log; Monitoring Well Construction Forms and Technical Results
- D Analytical Results; Initial Site Screening
- E Analytical Results; On-site Screening
- F Surface Water and Sediment Sampling Forms
- G Monitoring Well Development and Sampling Forms
- H Surveying Data
- I Analytical Results; Investigation Derived Wastes - Decontamination Water and Soil Cuttings

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NTIS	<input checked="" type="checkbox"/>
DTIC	<input type="checkbox"/>
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Justification	
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A-1	



## **Appendix A: Field Change Request Forms**



## FIELD CHANGE REQUEST FORM

Field Change No. 1Page 1 of 1PROJECT Phelps Collins ANG RI, Alpena, MichPROJECT NO. 931800-12APPLICABLE DOCUMENT: Final RI SAP

## DESCRIPTION:

page 2-29 of SAP states "shoreline sampling will be cored using a minuteman portable drill apparatus" field team suggests using a sediment/sludge sampling hand auger.

## REASON:

uncompacted, saturated sediments in the bottom of the sinkhole will not allow for a borehole to stay open; using a minuteman would not allow for sampling

## RECOMMENDED DISPOSITION:

Use hand auger with sediment catcher attachment; samples will be collected in 5.5 steel liners if possible; Placed into jars if sleeves will not work

## IMPACT ON PRESENT AND COMPLETED WORK:

no cost change; however, deeper sample collection (3 to 5 feet) will not be practical if the holes will not stay open

## FINAL DISPOSITION:

REQUESTED BY:  
FIELD / PROJECT MANAGER:J. Buegel 7/29/93APPROVALS:  
HAZWRAP PROJECT MANAGER:

### Field Change Request

Project name <u>Phelps Collins AWG</u>	Project Number <u>931800</u>
Applicable Document <u>RI SAP Final</u>	Date <u>8/11/93</u>

Description: where possible  
Surface soil samples will be collected  
using the drill rig, 3", 2-foot long split spoons  
equipped w/ stainless steel liners; SAP says we will use  
a hand auger

Minor change ☒ Major change ☐ Major project impact ☐

Requested by: Jack S Briegel

Reason for change:  
All soil samples will be collected with the  
same methods; same rinsates, etc. Samples  
will be obtained from the first foot.

Recommended disposition:  
Approve as recommended

Impact on present and completed work:  
no impact - samples will still be representative  
of surface conditions and volatile compounds  
will be better retained.

Accepted <input checked="" type="checkbox"/>	Rejected <input type="checkbox"/>	Signature <u>Jean E McKee</u>	Date <u>8-24-93</u>
		Project Manager	
Accepted <input type="checkbox"/>	Rejected <input type="checkbox"/>	Signature _____	Date _____
		Project QA/QC Officer	

(Required prior to Implementation of major changes)

Accepted <input type="checkbox"/>	Rejected <input type="checkbox"/>	Signature _____	Date _____
		Program Manager	
Accepted <input type="checkbox"/>	Rejected <input type="checkbox"/>	Signature _____	Date _____
		Program QA/QC Officer	

(Required prior to implementation of changes with major project impact)

Approved <input type="checkbox"/>	Rejected <input type="checkbox"/>	Signature _____	Date _____
		CLIENT Project Manager	

Final Disposition \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

# Field Change Request

Project name <u>Phelps Collins ANGR</u>	Project Number <u>931800-12</u>
Applicable Document <u>Final SAP Dec. 1992</u>	Date <u>Aug 24, 1993</u>

Description: Page 2-72 PSP: "newly constructed wells will be allowed to stabilize approximately one week after well development and prior to sampling". Wells will be allowed to stabilize approx 48 hr after development prior to sampling

Minor change ☒ Major change ☐ Major project impact ☐

Requested by: Jack Briegel

Reason for change:

150 IF monitoring wells are allowed to stabilize one week after development and additional mobilization will be necessary prior to sampling these wells. 48 hrs should be sufficient time for stabilization

Recommended disposition:

Approved Recommended

Impact on present and completed work:

No impact

Accepted ☒

Rejected ☐

Signature Jean E. McKee

Project Manager

Date 8-25-93

Accepted ☐

Rejected ☐

Signature \_\_\_\_\_

Project QA/QC Officer

Date \_\_\_\_\_

(Required prior to implementation of major changes)

Accepted ☐

Rejected ☐

Signature \_\_\_\_\_

Program Manager

Date \_\_\_\_\_

Accepted ☐

Rejected ☐

Signature \_\_\_\_\_

Program QA/QC Officer

Date \_\_\_\_\_

(Required prior to implementation of changes with major project impact)

Approved ☐

Rejected ☐

Signature \_\_\_\_\_

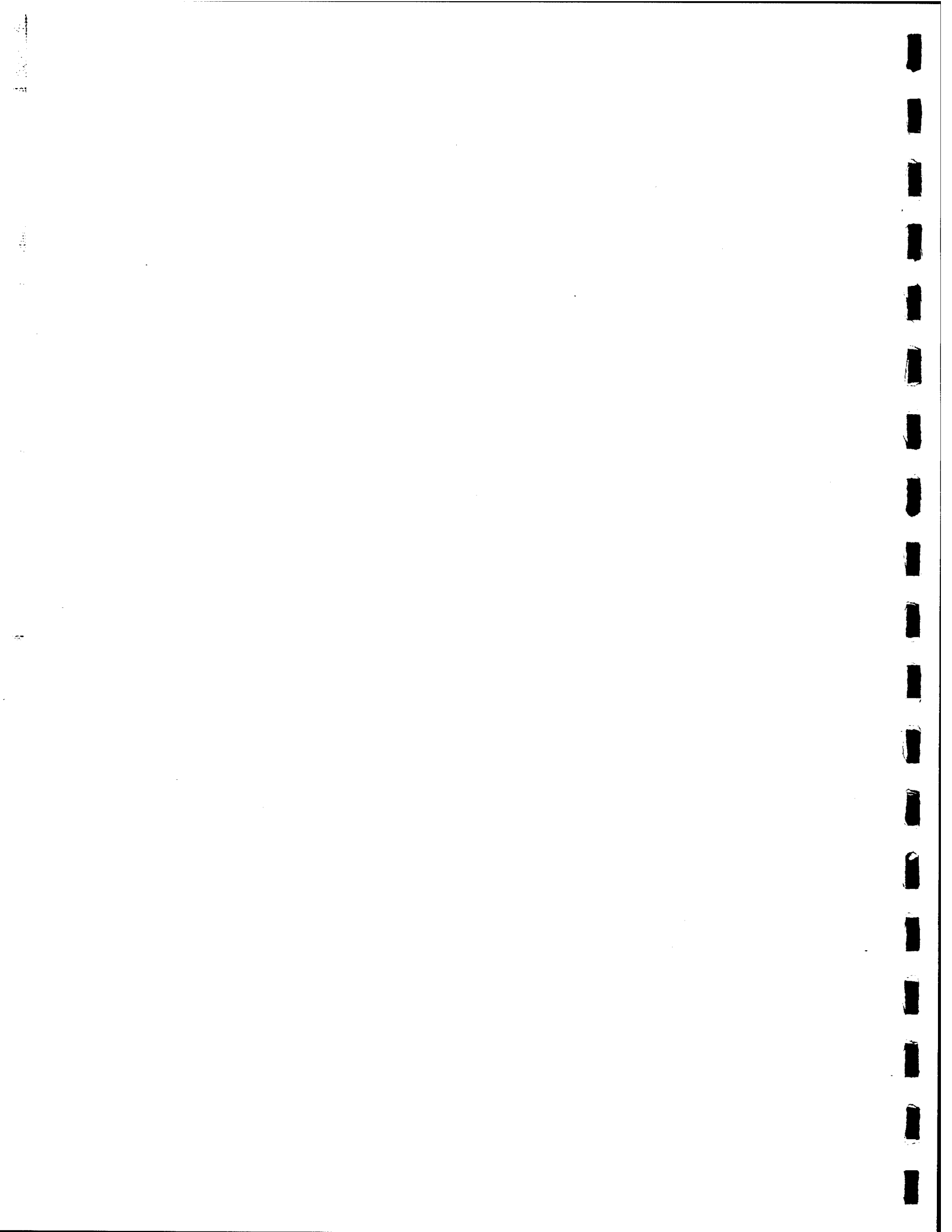
CLIENT Project Manager

Date \_\_\_\_\_

Final Disposition \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_



**Appendix B: Groundwater and Surface Water Elevation  
Measurements and Aquifer Testing Results**



LOCATION	ID NUMBER	DATE	ELEVATION OF REFERENCE POINT		DEPTH TO GRNDWT	GROUNDWATER ELEVATION
			TOP OF PRO CASING	TOP OF PVC RISER		
SITE 1	S1MW1	SEPT. 12, 1993		678.23	1.64	676.59
	S1MW2	SEPT. 12, 1993		681.16	3.77	677.39
	S1MW3	SEPT. 12, 1993		680.55	3.4	677.15
	S1MW4	SEPT. 12, 1993		678.94	2.74	676.2
	S1MW6	SEPT. 12, 1993		680.66	4.46	676.2
	S1MW11	SEPT. 12, 1993		679.28	3.56	675.72
	S1MW12	SEPT. 12, 1993		677.74	3.19	674.55
	S1MW13	SEPT. 12, 1993		680.2	4.99	675.21
	S1MW14	SEPT. 12, 1993		680.27	6.35	673.92
	S1MW14	SEPT. 12, 1993		682.62	5.93	676.69
SITE 2	MP2MW1	SEPT. 12, 1993		683.78	8.3	675.48
	MP2MW2	SEPT. 12, 1993	683.87	683.28	7.92	675.36
	MP2MW3	SEPT. 12, 1993	683.43	683.44	8.31	675.13
	MP2MW4	SEPT. 12, 1993	683.59	683.39	8.07	675.5
	MP2MW5	SEPT. 12, 1993	683.47	682.85	7.99	674.86
	MP2MW6	SEPT. 12, 1993		682.78	6.72	676.06
	MP2MW7	SEPT. 12, 1993		691.73	15.11	676.62
SITE 3	CG3PZ1	SEPT. 12, 1993		687.87	10.58	677.29
	CG3MW1	SEPT. 12, 1993	687.96	694.3	18.12	676.29
	CG3MW2	SEPT. 12, 1993	694.41	689.8	13.51	676.5
	CG3MW3	SEPT. 12, 1993	690.01	694	17.71	676.42
	CG3MW4	SEPT. 12, 1993	694.13	694.09	17.86	676.4
	CG3MW5	SEPT. 12, 1993	694.26	691.29	14.77	676.52
	CG3MW6	SEPT. 12, 1993		690.14	14.5	675.64
	CG3MW7	SEPT. 12, 1993		690.14	23.01	667.23
SITE 4	TF4MW1	SEPT. 12, 1993	690.24	684.75	29.02	659.61
	TF4MW2	SEPT. 12, 1993	688.63	685.91	26.94	658.06
	TF4MW3	SEPT. 12, 1993	685	688.41	27.78	658.36
	TF4MW4	SEPT. 12, 1993	686.14	690.05	6.88	674.15
SITE 5	SF5MW1	SEPT. 12, 1993	681.03	680.93	5.97	675.32
	SF5MW2	SEPT. 12, 1993	681.29	680.21	7.67	674.6
	SF5MW3	SEPT. 12, 1993	682.27	682.14	7.65	674.32
	SF5MW4	SEPT. 12, 1993	681.97	681.78	7.65	674.38
	SF5MW5	SEPT. 12, 1993		680.59	6.21	674.26
	SF5MW6	SEPT. 12, 1993		680.52	6.26	674.2
	SF5MW7	SEPT. 12, 1993		681.26	7.06	674.07
	SF5MW8	SEPT. 12, 1993		681.12	7.05	674.07
	SF5MW9	SEPT. 12, 1993		681.24	7.3	673.94
SITE 6	LF6MW1	SEPT. 12, 1993	690.54	690.38	18.44	672.1
	LF6MW2	SEPT. 12, 1993	685.01	684.86	12.33	672.68
	LF6MW3	SEPT. 12, 1993	687.14	686.97	15.21	671.93
	LF6MW4	SEPT. 12, 1993		684.59	11.84	672.75
	LF6MW5	SEPT. 12, 1993		683.71	10.64	673.07
	LF6MW6	SEPT. 12, 1993		687.18	16.01	671.17
	LF6MW8	SEPT. 12, 1993		685.01	11.89	673.12
	LF6MW9	SEPT. 12, 1993		684.21	10.87	673.34
	LF6MW10	SEPT. 12, 1993		682.7	11	671.7
	LF6MW10	SEPT. 12, 1993		687.11	10.19	676.96
SITE 8	HN8MW1	SEPT. 12, 1993	687.15	692.91	17.69	675.31
	HN8MW2	SEPT. 12, 1993	693	693.47	17.62	676.03
	HN8MW3	SEPT. 12, 1993	693.65	693.84	17.75	676
	HN8MW4	SEPT. 12, 1993	693.75	687.49	11.37	676.12
	HN8MW5	SEPT. 12, 1993		690.79	17.94	673.06
SITE 9	RT9MW1	SEPT. 12, 1993	691	692.63	24.64	668.21
	RT9MW2	SEPT. 12, 1993	692.85	685.22	14.78	670.72
	RT9MW3	SEPT. 12, 1993	685.5	687.52	20.6	667.17
	RT9MW4	SEPT. 12, 1993	687.77	687.61	21.08	666.77
	RT9MW5	SEPT. 12, 1993	687.85	685	14.42	670.58
	RT9MW6	SEPT. 12, 1993		685	14.42	670.58
	RT9MW6	SEPT. 12, 1993		685	14.42	670.58
LOCATION	ID	DATE	BENCH MARK		MEASUREMENT	SURFACE WATER ELEVATION
SINKHOLE	SPRING 1	SEPT. 13, 1993		651.31		651.2
SINKHOLE	SPRING 2	SEPT. 13, 1993		651.31		651.1
SINKHOLE	SPRING 3	SEPT. 13, 1993		651.31		648.7
SINKHOLE	SPRING 4	SEPT. 13, 1993		651.31		651.5
SINKHOLE	SPRING 5	SEPT. 13, 1993		651.31		652.5
SINKHOLE	SPRING 6	SEPT. 13, 1993		651.31		649.7
SINKHOLE	SPRING 6	SEPT. 13, 1993		651.31		671.6
XTRM NORTH	Gauge 3	AUG. 1993		674.18	2.58	671.56
NORTH	Gauge 2	AUG. 1993		676.14	4.58	671.47
LANDFILL 6	Gauge 4	AUG. 1993		675.04	3.57	671.42
BY SITE 1	Gauge 5	AUG. 1993		674.72	3.3	671.42
SINKHOLE	Gauge 1	AUG. 1993		649.95	3.25	646.7

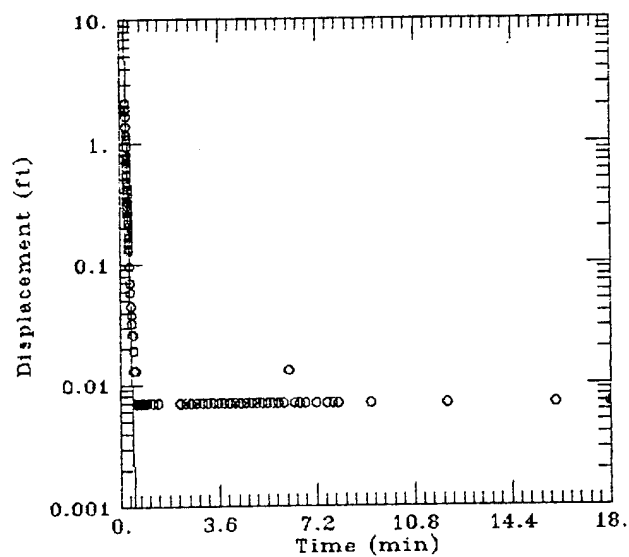
Note: TOP OF PRO CASING is from November 1987 survey data.  
TOP OF PVC RISER is from August 1993 survey data.



## **Aquifer Testing Results**



# 2mw6 / Alpena, MI



## DATA SET:

2mw6.dst  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Huwer-Hice

## ESTIMATED PARAMETERS:

K = 0.01472 ft/min  
y0 = 427.2 ft

## TEST DATA:

H0 = 1.9 ft  
rc = 0.083 ft  
rw = 0.343 ft  
L = 15. ft  
b = 30. ft  
H = 19. ft

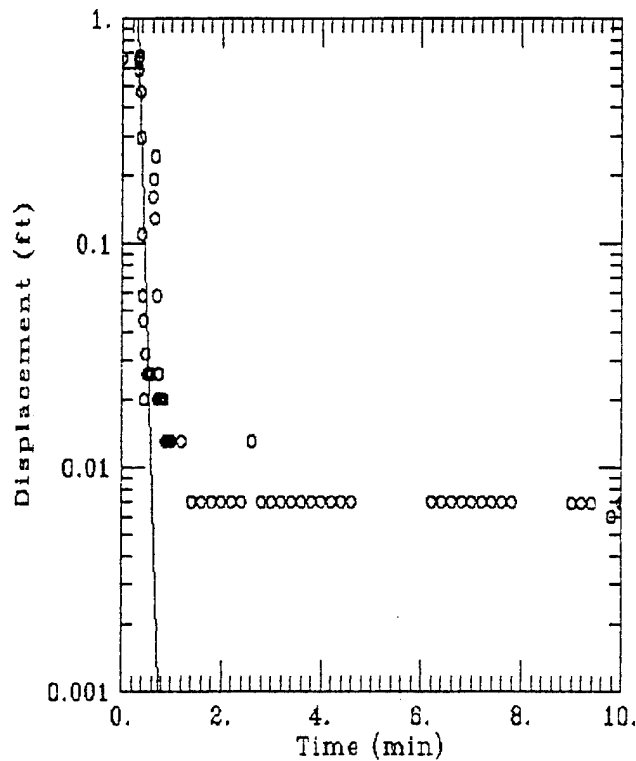
SITE 2 MONITORING WELL #6 (SLUG IN)

TIME (Min)	DRAWDOWN (ft)	WEIGHT
0.2233	2.118	1
0.2266	1.87	1
0.23	1.659	1
0.2333	1.366	1
0.25	1.168	1
0.2533	1.085	1
0.2566	0.944	1
0.26	0.804001	1
0.2633	0.771999	1
0.2666	0.696001	1
0.27	0.625	1
0.2733	0.549	1
0.2766	0.485	1
0.28	0.447	1
0.2833	0.408001	1
0.2866	0.370001	1
0.29	0.332001	1
0.2933	0.306	1
0.2966	0.281	1
0.3	0.254999	1
0.3033	0.236	1
0.3066	0.217001	1
0.31	0.204	1
0.3133	0.191999	1
0.3166	0.179001	1
0.32	0.166	1
0.3233	0.153	1
0.3266	0.146999	1
0.33	0.134001	1
0.3333	0.128	1
0.35	0.0960006	1
0.3666	0.0699996	1
0.3833	0.0580005	1
0.4	0.045	1
0.4166	0.038	1
0.4333	0.0319995	1
0.45	0.0260009	1
0.4666	0.0260009	1
0.4833	0.0190009	1
0.5	0.0190009	1
0.5166	0.0130004	1
0.5333	0.0130004	1
0.55	0.0130004	1
0.5666	0.0130004	1
0.5833	0.00699986	1
0.6	0.00699986	1
0.6166	0.00699986	1
0.6333	0.00699986	1
0.65	0.00699986	1
0.6666	0.00699986	1
0.6833	0.00699986	1
0.7	0.00699986	1

SITE 2 MONITORING WELL #6 (SLUG IN)

TIME (Min)	DRAWDOWN (ft)	WEIGHT
0.7166	0.00699986	1
0.7333	0.00699986	1
0.75	0.00699986	1
0.7666	0.00699986	1
0.7833	0.00699986	1
0.8	0.00699986	1
0.8166	0.00699986	1
0.8333	0.00699986	1
0.85	0.00699986	1
0.8666	0.00699986	1
0.8833	0.00699986	1
0.9	0.00699986	1
0.9166	0.00699986	1
0.9333	0.00699986	1
0.95	0.00699986	1
0.9666	0.00699986	1
0.9833	0.00699986	1
1	0.00699986	1
1.2	0.00699986	1
1.4	0.00699986	1
2.2	0.00699986	1
2.4	0.00699986	1
2.6	0.00699986	1
2.8	0.00699986	1
3	0.00699986	1
3.2	0.00699986	1
3.4	0.00699986	1
3.6	0.00699986	1
3.8	0.00699986	1
4	0.00699986	1
4.2	0.00699986	1
4.4	0.00699986	1
4.6	0.00699986	1
4.8	0.00699986	1
5	0.00699986	1
5.2	0.00699986	1
5.4	0.00699986	1
5.6	0.00699986	1
5.8	0.00699986	1
6	0.00699986	1
6.2	0.0130004	1
6.4	0.00699986	1
6.6	0.00699986	1
6.8	0.00699986	1
7.2	0.00699986	1
7.6	0.00699986	1
7.8	0.00699986	1
8	0.00699986	1
9.2	0.00699986	1
12	0.00699986	1
16	0.00699986	1
18	0.00699986	1

# 2mw6a / Alpena, MI



## DATA SET:

2mw6a.dat  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bover-Rice

## ESTIMATED PARAMETERS:

$K = 0.01021$  ft/min  
 $y_0 = 147.2$  ft

## TEST DATA:

$H_0 = 0.664$  ft  
 $r_c = 0.083$  ft  
 $r_w = 0.343$  ft  
 $L = 15.$  ft  
 $b = 30.$  ft  
 $H = 21.$  ft

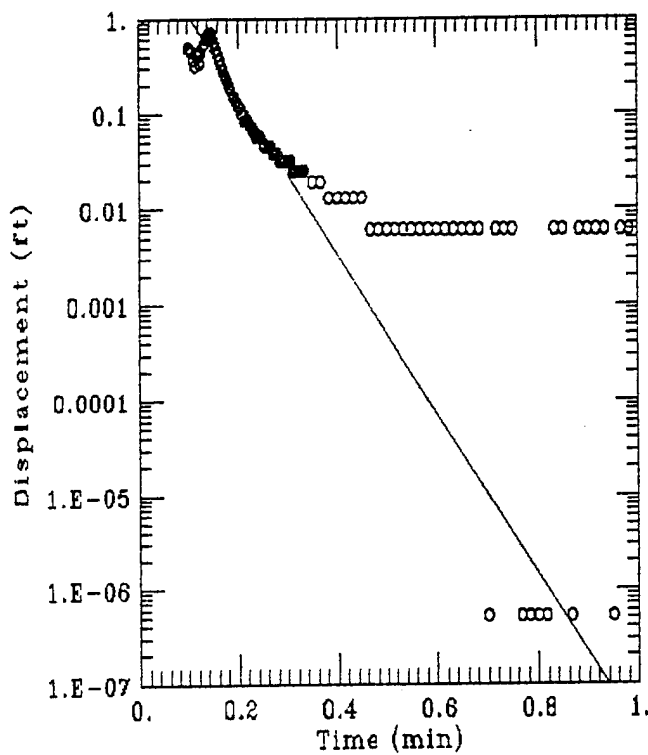
SITE 2 MONITORING WELL #6 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.3266	0.664	1
0.33	0.638	1
0.3333	0.587	1
0.35	0.677	1
0.3666	0.473	1
0.3833	0.294001	1
0.4	0.108999	1
0.4166	0.0580006	1
0.4333	0.0450001	1
0.45	0.0200005	1
0.4666	0.0319996	1
0.4833	0.0319996	1
0.5	0.0259991	1
0.5166	0.0259991	1
0.5333	0.0259991	1
0.55	0.0259991	1
0.5666	0.0259991	1
0.5833	0.0259991	1
0.6	0.0259991	1
0.6166	0.16	1
0.6333	0.191999	1
0.65	0.128	1
0.6666	0.243	1
0.6833	-0.0310001	1
0.7	0.0580006	1
0.7166	0.0200005	1
0.7333	0.0259991	1
0.75	0.0259991	1
0.7666	0.0200005	1
0.7833	0.0200005	1
0.8	0.0200005	1
0.8166	0.0200005	1
0.8333	0.0200005	1
0.85	0.0200005	1
0.8666	0.0130005	1
0.8833	0.0130005	1
0.9	0.0130005	1
0.9166	0.0130005	1
0.9333	0.0130005	1
0.95	0.0130005	1
0.9666	0.0130005	1
0.9833	0.0130005	1
1	0.0130005	1
1.2	0.0130005	1
1.4	0.00699997	1
1.6	0.00699997	1
1.8	0.00699997	1
2	0.00699997	1
2.2	0.00699997	1
2.4	0.00699997	1
2.6	0.0130005	1
2.8	0.00699997	1

SITE 2 MONITORING WELL #6 (SLUG IN)

TIME (Min)	DRAWDOWN (ft)	WEIGHT
3	0.00699997	1
3.2	0.00699997	1
3.4	0.00699997	1
3.6	0.00699997	1
3.8	0.00699997	1
4	0.00699997	1
4.2	0.00699997	1
4.4	0.00699997	1
4.6	0.00699997	1
6.2	0.00699997	1
6.4	0.00699997	1
6.6	0.00699997	1
6.8	0.00699997	1
7	0.00699997	1
7.2	0.00699997	1
7.4	0.00699997	1
7.6	0.00699997	1
7.8	0.00699997	1
9	0.00699997	1
9.2	0.00699997	1
9.4	0.00699997	1
9.8	0.00699997	1
10	0.00699997	1

# 2mw6b / Alpena, MI



## DATA SET:

2mw6b.dat

10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bowser-Rice

## ESTIMATED PARAMETERS:

$K = 0.01179$  ft/min

$yD = 7.499$  ft

## TEST DATA:

$HU = 1$  ft

$rc = 0.083$  ft

$rw = 0.343$  ft

$L = 15$  ft

$b = 30$  ft

$H = 19$  ft

SITE 2 MONITORING WELL #6 (SLUG OUT)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.1	0.484999	1
0.1033	0.472001	1
0.1066	0.446999	1
0.11	0.376	1
0.1133	0.319001	1
0.1166	0.427001	1
0.12	0.402001	1
0.1233	0.338	1
0.1266	0.434001	1
0.13	0.510001	1
0.1333	0.542	1
0.1366	0.612	1
0.14	0.644	1
0.1433	0.689	1
0.1466	0.689	1
0.15	0.644	1
0.1533	0.560999	1
0.1566	0.484999	1
0.16	0.415	1
0.1633	0.364001	1
0.1666	0.319001	1
0.17	0.286999	1
0.1733	0.255	1
0.1766	0.23	1
0.18	0.210999	1
0.1833	0.191001	1
0.1866	0.171999	1
0.19	0.153	1
0.1933	0.147	1
0.1966	0.133999	1
0.2	0.121001	1
0.2033	0.115	1
0.2066	0.102	1
0.21	0.0959993	1
0.2133	0.0830007	1
0.2166	0.0830007	1
0.22	0.0830007	1
0.2233	0.0760007	1
0.2266	0.0700002	1
0.23	0.0700002	1
0.2333	0.0639997	1
0.2366	0.0569997	1
0.24	0.0569997	1
0.2433	0.0569997	1
0.2466	0.0569997	1
0.25	0.0509992	1
0.2533	0.0450006	1
0.2566	0.0450006	1
0.26	0.0450006	1
0.2633	0.0450006	1
0.2666	0.0450006	1
0.27	0.0380006	1

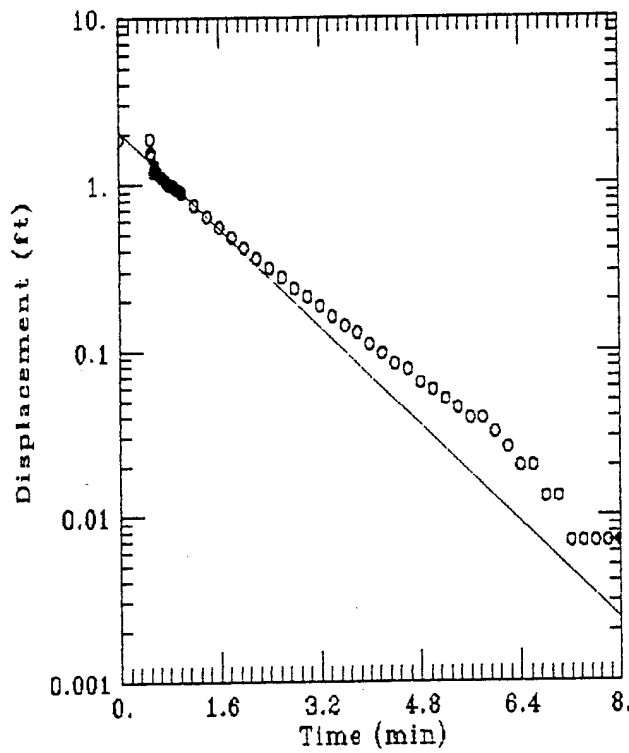
SITE 2 MONITORING WELL #6 (SLUG OUT)

TIME (Min)	DRAWDOWN (ft)	WEIGHT
0.2733	0.0380006	1
0.2766	0.0380006	1
0.28	0.0380006	1
0.2833	0.0320001	1
0.2866	0.0320001	1
0.29	0.0320001	1
0.2933	0.0320001	1
0.2966	0.0320001	1
0.3	0.0320001	1
0.3033	0.0320001	1
0.3066	0.0320001	1
0.31	0.0250001	1
0.3133	0.0250001	1
0.3166	0.0250001	1
0.32	0.0250001	1
0.3233	0.0250001	1
0.3266	0.0250001	1
0.33	0.0250001	1
0.3333	0.0250001	1
0.35	0.0189996	1
0.3666	0.0189996	1
0.3833	0.0129991	1
0.4	0.0129991	1
0.4166	0.0129991	1
0.4333	0.0129991	1
0.45	0.0129991	1
0.4666	0.00599913	1
0.4833	0.00599913	1
0.5	0.00599913	1
0.5166	0.00599913	1
0.5333	0.00599913	1
0.55	0.00599913	1
0.5666	0.00599913	1
0.5833	0.00599913	1
0.6	0.00599913	1
0.6166	0.00599913	1
0.6333	0.00599913	1
0.65	0.00599913	1
0.6666	0.00599913	1
0.6833	0.00599913	1
0.7166	0.00599913	1
0.7333	0.00599913	1
0.75	0.00599913	1
0.8333	0.00599913	1
0.85	0.00599913	1
0.8833	0.00599913	1
0.9	0.00599913	1
0.9166	0.00599913	1
0.9333	0.00599913	1
0.9666	0.00599913	1
0.9833	0.00599913	1
1	0.00599913	1

SITE 2 MONITORING WELL #6 (SLUG OUT)

TIME (min)	DRAWDOWN (ft)	WEIGHT
2	-0.006	1
2.2	-0.006	1
2.4	-0.006	1
2.6	-0.006	1
2.8	-0.006	1
3	-0.006	1
3.2	-0.006	1
3.4	-0.006	1
3.6	-0.006	1
3.8	-0.006	1
4	-0.006	1
4.2	-0.006	1
4.4	-0.006	1
4.6	-0.006	1
4.8	-0.006	1
5	-0.006	1
5.2	-0.006	1
5.4	-0.006	1
5.6	-0.006	1
5.8	-0.006	1
6	-0.006	1
6.6	-0.006	1
6.8	-0.006	1
7	-0.006	1

# 6mw6in / Alpena, MI



## DATA SET:

6mw6in.dat  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bowser Rice

## ESTIMATED PARAMETERS:

$K = 0.0005844$  ft/min  
 $yD = 2.878$  ft

## TEST DATA:

$HU = 1.8$  ft  
 $rc = 0.083$  ft  
 $rw = 0.343$  ft  
 $L = 10$  ft  
 $b = 33$  ft  
 $II = 15$  ft

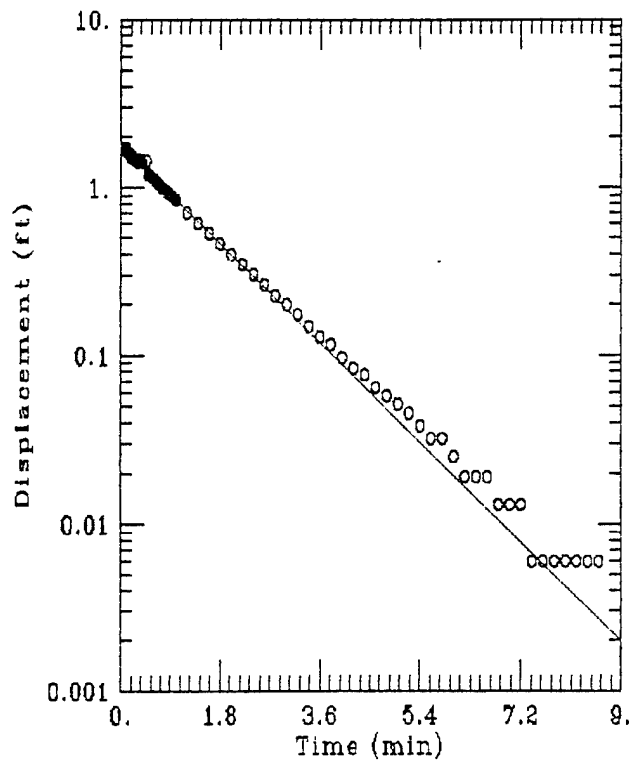
SITE 6 MONITORING WELL #6 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.5	1.87	1
0.5166	1.544	1
0.5333	1.474	1
0.55	1.193	1
0.5666	1.225	1
0.5833	1.276	1
0.6	1.213	1
0.6166	1.181	1
0.6333	1.162	1
0.65	1.136	1
0.6666	1.123	1
0.6833	1.104	1
0.7	1.091	1
0.7166	1.079	1
0.7333	1.059	1
0.75	1.04	1
0.7666	1.021	1
0.7833	1.002	1
0.8	0.989	1
0.8166	0.989	1
0.8333	0.983	1
0.85	0.983	1
0.8666	0.969999	1
0.8833	0.964001	1
0.9	0.951	1
0.9166	0.938	1
0.9333	0.924999	1
0.95	0.919001	1
0.9666	0.906	1
0.9833	0.893999	1
1	0.881001	1
1.2	0.747	1
1.4	0.638	1
1.6	0.549	1
1.8	0.479	1
2	0.415001	1
2.2	0.358	1
2.4	0.313	1
2.6	0.275	1
2.8	0.236	1
3	0.211	1
3.2	0.184999	1
3.4	0.16	1
3.6	0.141001	1
3.8	0.128	1
4	0.108999	1
4.2	0.0960007	1
4.4	0.0830002	1
4.6	0.0769997	1
4.8	0.0639992	1
5	0.0580006	1
5.2	0.0510006	1

SITE 6 MONITORING WELL #6 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
5.4	0.0450001	1
5.6	0.0389996	1
5.8	0.0389996	1
6	0.0319996	1
6.2	0.0259991	1
6.4	0.0200005	1
6.6	0.0200005	1
6.8	0.0130005	1
7	0.0130005	1
7.2	0.00699997	1
7.4	0.00699997	1
7.6	0.00699997	1
7.8	0.00699997	1
8	0.00699997	1

# 6mw6out / Alpena, MI



## DATA SET:

6mw6out.dat  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bowser-Rice

## ESTIMATED PARAMETERS:

$K = 0.0006085$  ft/min  
 $rD = 1.78$  ft

## TEST DATA:

$HU = 1.703$  ft  
 $rc = 0.083$  ft  
 $rw = 0.343$  ft  
 $L = 10.$  ft  
 $b = 33.$  ft  
 $H = 15.$  ft

SITE 6 MONITORING WELL #6 (SLUG OUT)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.1	1.703	1
0.1033	1.652	1
0.1066	1.652	1
0.11	1.652	1
0.1133	1.639	1
0.1166	1.627	1
0.12	1.627	1
0.1233	1.62	1
0.1266	1.614	1
0.13	1.607	1
0.1333	1.601	1
0.1366	1.595	1
0.14	1.588	1
0.1433	1.588	1
0.1466	1.588	1
0.15	1.582	1
0.1533	1.582	1
0.1566	1.582	1
0.16	1.569	1
0.1633	1.576	1
0.1666	1.576	1
0.17	1.576	1
0.1733	1.525	1
0.1766	1.531	1
0.18	1.518	1
0.1833	1.505	1
0.1866	1.525	1
0.19	1.531	1
0.1933	1.531	1
0.1966	1.525	1
0.2	1.531	1
0.2033	1.531	1
0.2066	1.512	1
0.21	1.512	1
0.2133	1.518	1
0.2166	1.512	1
0.22	1.512	1
0.2233	1.512	1
0.2266	1.499	1
0.23	1.486	1
0.2333	1.48	1
0.2366	1.48	1
0.24	1.473	1
0.2433	1.467	1
0.2466	1.461	1
0.25	1.467	1
0.2533	1.461	1
0.2566	1.454	1
0.26	1.454	1
0.2633	1.448	1
0.2666	1.448	1
0.27	1.442	1

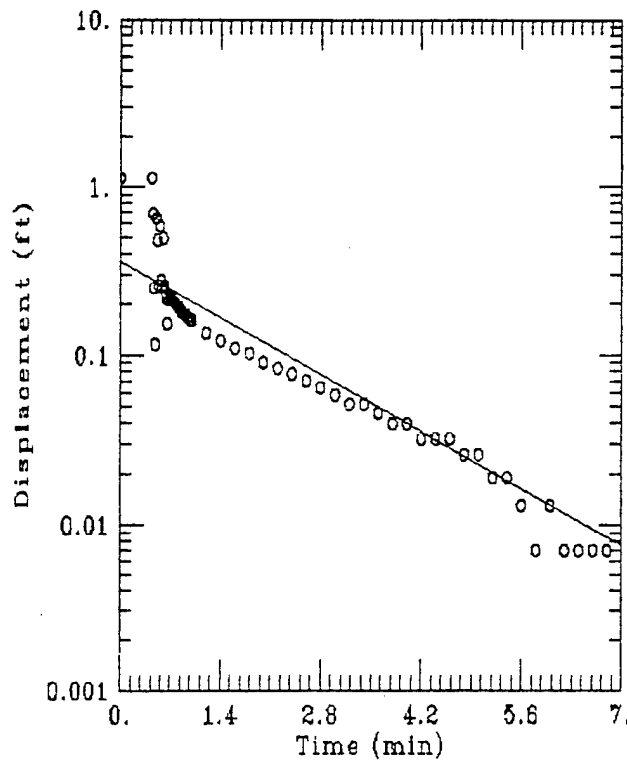
SITE 6 MONITORING WELL #6 (SLUG OUT)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.2733	1.442	1
0.2766	1.435	1
0.28	1.435	1
0.2833	1.435	1
0.2866	1.429	1
0.29	1.429	1
0.2933	1.429	1
0.2966	1.429	1
0.3	1.429	1
0.3033	1.422	1
0.3066	1.41	1
0.31	1.435	1
0.3133	1.422	1
0.3166	1.422	1
0.32	1.429	1
0.3233	1.422	1
0.3266	1.435	1
0.33	1.435	1
0.3333	1.448	1
0.35	1.422	1
0.3666	1.422	1
0.3833	1.416	1
0.4666	1.435	1
0.4833	1.199	1
0.5	1.193	1
0.5166	1.18	1
0.5333	1.167	1
0.55	1.148	1
0.5666	1.135	1
0.5833	1.123	1
0.6	1.11	1
0.6166	1.097	1
0.6333	1.084	1
0.65	1.072	1
0.6666	1.059	1
0.6833	1.046	1
0.7	1.033	1
0.7166	1.021	1
0.7333	1.008	1
0.75	0.995	1
0.7666	0.989	1
0.7833	0.976	1
0.8	0.963	1
0.8166	0.95	1
0.8333	0.944	1
0.85	0.931	1
0.8666	0.918	1
0.8833	0.912	1
0.9	0.899	1
0.9166	0.887	1
0.9333	0.88	1
0.95	0.867	1

SITE 6 MONITORING WELL #6 (SLUG OUT)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.9666	0.855	1
0.9833	0.848	1
1	0.842	1
1.2	0.702	1
1.4	0.606	1
1.6	0.529	1
1.8	0.459	1
2	0.395	1
2.2	0.344	1
2.4	0.3	1
2.6	0.261	1
2.8	0.223	1
3	0.198	1
3.2	0.172	1
3.4	0.147	1
3.6	0.127	1
3.8	0.115	1
4	0.0960002	1
4.2	0.0829997	1
4.4	0.0759997	1
4.6	0.0639996	1
4.8	0.0569997	1
5	0.0510001	1
5.2	0.0449996	1
5.4	0.0379996	1
5.6	0.032	1
5.8	0.032	1
6	0.0250001	1
6.2	0.0189996	1
6.4	0.0189996	1
6.6	0.0189996	1
6.8	0.013	1
7	0.013	1
7.2	0.013	1
7.4	0.00600002	1
7.6	0.00600002	1
7.8	0.00600002	1
8	0.00600002	1
8.2	0.00600002	1
8.4	0.00600002	1
8.6	0.00600002	1

# 6mw4 / Alpena, MI



## DATA SET:

6mw4.dat  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bowyer-Rice

## ESTIMATED PARAMETERS:

$K = 0.0003813$  ft/min  
 $y_0 = 0.3565$  ft

## TEST DATA:

$HU = 1.129$  ft  
 $rc = 0.083$  ft  
 $rw = 0.343$  ft  
 $L = 10.$  ft  
 $b = 20.$  ft  
 $H = 7.$  ft

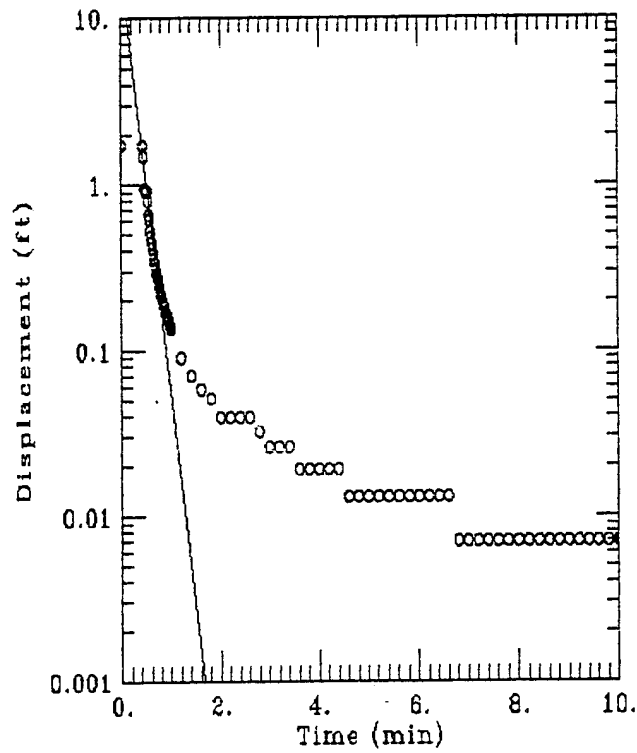
SITE 6 MONITORING WELL #4 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.4333	1.129	1
0.45	0.689	1
0.4666	0.249	1
0.4833	0.115001	1
0.5	0.644999	1
0.5166	0.478999	1
0.5333	0.255	1
0.55	0.581	1
0.5666	0.275001	1
0.5833	0.249	1
0.6	0.492	1
0.6166	0.255	1
0.6333	0.217	1
0.65	0.153001	1
0.6666	0.210999	1
0.6833	0.224	1
0.7	0.217	1
0.7166	0.210999	1
0.7333	0.210999	1
0.75	0.203999	1
0.7666	0.198001	1
0.7833	0.198001	1
0.8	0.192	1
0.8166	0.192	1
0.8333	0.185	1
0.85	0.179	1
0.8666	0.179	1
0.8833	0.172999	1
0.9	0.172999	1
0.9166	0.172999	1
0.9333	0.165999	1
0.95	0.165999	1
0.9666	0.160001	1
0.9833	0.160001	1
1	0.160001	1
1.2	0.134	1
1.4	0.120999	1
1.6	0.109	1
1.8	0.102	1
2	0.0899991	1
2.2	0.0829992	1
2.4	0.0770006	1
2.6	0.0700006	1
2.8	0.0640001	1
3	0.0579996	1
3.2	0.0509996	1
3.4	0.0509996	1
3.6	0.0449991	1
3.8	0.0390005	1
4	0.0390005	1
4.2	0.0320005	1
4.4	0.0320005	1

SITE 6 MONITORING WELL #4 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
4.6	0.0320005	1
4.8	0.026	1
5	0.026	1
5.2	0.019	1
5.4	0.019	1
5.6	0.0129995	1
5.8	0.00700087	1
6	0.0129995	1
6.2	0.00700087	1
6.4	0.00700087	1
6.6	0.00700087	1
6.8	0.00700087	1

# 5mw5 / Alpena, MI



## DATA SET:

5mw5.dat  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bowser Rice

## ESTIMATED PARAMETERS:

$K = 0.004464 \text{ ft/min}$   
 $y_0 = 19.39 \text{ ft}$

## TEST DATA:

$H_0 = 1.723 \text{ ft}$   
 $r_c = 0.083 \text{ ft}$   
 $r_w = 0.343 \text{ ft}$   
 $L = 10. \text{ ft}$   
 $b = 15. \text{ ft}$   
 $H = 9. \text{ ft}$

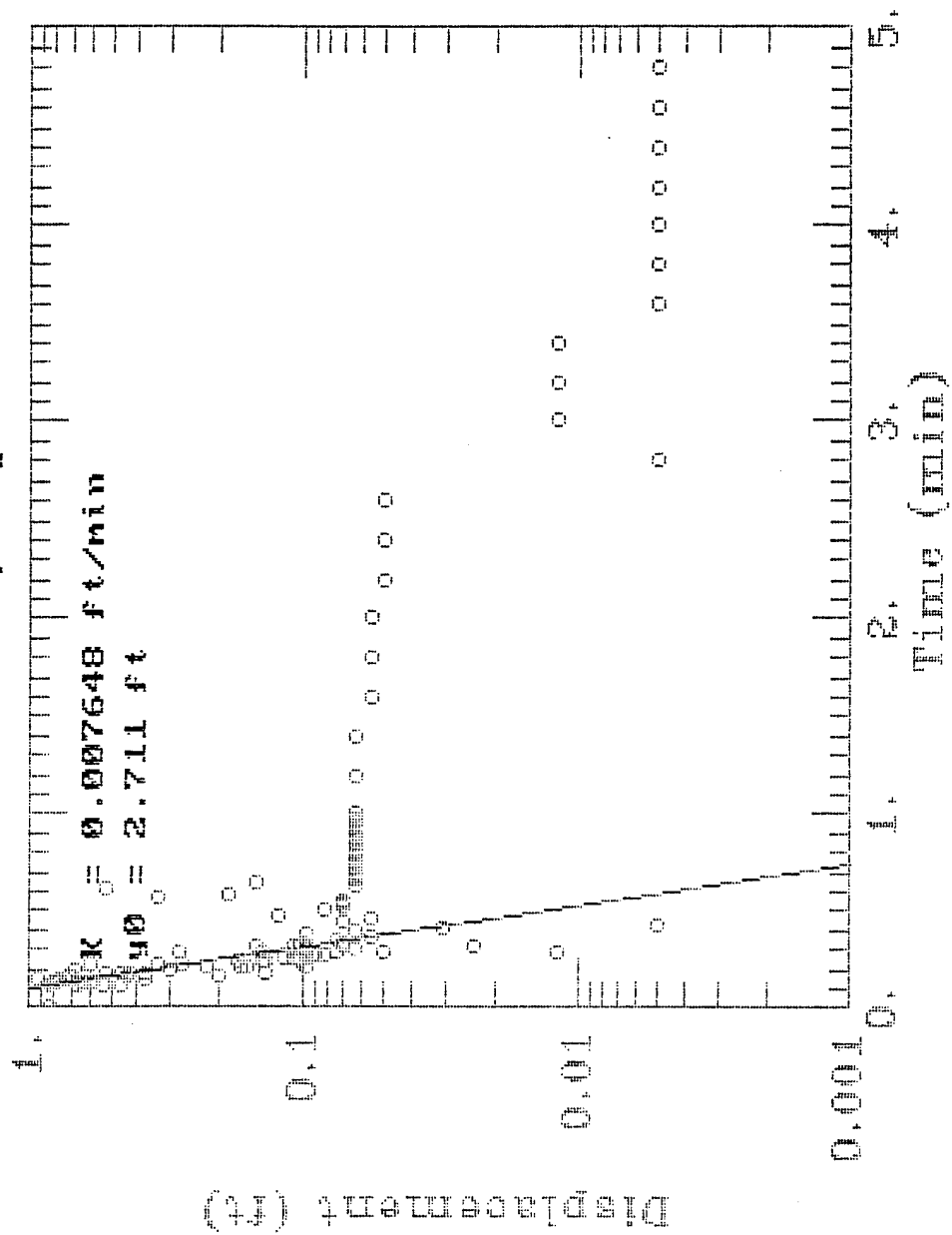
SITE 5 MONITORING WELL #5 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.4333	1.723	1
0.45	1.48	1
0.4666	0.944	1
0.5	0.9	1
0.5166	0.919	1
0.5333	0.798	1
0.55	0.657	1
0.5666	0.619	1
0.5833	0.523	1
0.6	0.485	1
0.6166	0.447	1
0.6333	0.415	1
0.65	0.383	1
0.6666	0.358	1
0.6833	0.332	1
0.7	0.307	1
0.7166	0.287	1
0.7333	0.275	1
0.75	0.256	1
0.7666	0.243	1
0.7833	0.23	1
0.8	0.217	1
0.8166	0.211	1
0.8333	0.198	1
0.85	0.192	1
0.8666	0.185	1
0.8833	0.173	1
0.9	0.166	1
0.9166	0.16	1
0.9333	0.16	1
0.95	0.153	1
0.9666	0.147	1
0.9833	0.141	1
1	0.134	1
1.2	0.0900001	1
1.4	0.0699996	1
1.6	0.0579996	1
1.8	0.0509996	1
2	0.0390005	1
2.2	0.0390005	1
2.4	0.0390005	1
2.6	0.0390005	1
2.8	0.0319995	1
3	0.026	1
3.2	0.026	1
3.4	0.026	1
3.6	0.019	1
3.8	0.019	1
4	0.019	1
4.2	0.019	1
4.4	0.019	1
4.6	0.0130004	1

SITE 5 MONITORING WELL #5 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
4.8	0.0130004	1
5	0.0130004	1
5.2	0.0130004	1
5.4	0.0130004	1
5.6	0.0130004	1
5.8	0.0130004	1
6	0.0130004	1
6.2	0.0130004	1
6.4	0.0130004	1
6.6	0.0130004	1
6.8	0.00699992	1
7	0.00699992	1
7.2	0.00699992	1
7.4	0.00699992	1
7.6	0.00699992	1
7.8	0.00699992	1
8	0.00699992	1
8.2	0.00699992	1
8.4	0.00699992	1
8.6	0.00699992	1
8.8	0.00699992	1
9	0.00699992	1
9.2	0.00699992	1
9.4	0.00699992	1
9.6	0.00699992	1
9.8	0.00699992	1
10	0.00699992	1

# 1mw3in / Alpena, MI



SITE 1 MONITORING WELL #3 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.1133	0.836	1
0.1166	0.65	1
0.12	0.453	1
0.1233	0.529	1
0.1266	0.644	1
0.13	0.784	1
0.1333	0.816	1
0.1366	0.631	1
0.14	0.58	1
0.1433	0.721	1
0.1466	0.925	1
0.15	0.759	1
0.1533	0.37	1
0.1566	0.708	1
0.16	0.619	1
0.1633	0.434	1
0.1666	0.198	1
0.17	0.689	1
0.1733	0.427	1
0.1766	0.517	1
0.18	0.453	1
0.1833	0.134	1
0.1866	0.376	1
0.19	0.67	1
0.1933	-0.0700003	1
0.1966	-0.192	1
0.2	0.306	1
0.2033	0.223	1
0.2066	-0.504	1
0.21	0.166	1
0.2133	0.096	1
0.2166	0.159	1
0.22	0.338	1
0.2233	0.599	1
0.2266	0.274	1
0.23	-0.0379998	1
0.2333	-0.0069996	1
0.2366	0.14	1
0.24	0.172	1
0.2433	0.134	1
0.2466	0.102	1
0.25	0.108	1
0.2533	0.115	1
0.2566	0.108	1
0.26	0.102	1
0.2633	0.096	1
0.2666	0.0890001	1
0.27	0.096	1
0.2733	0.096	1
0.2766	0.0829996	1
0.28	0.0829996	1
0.2833	0.14	1

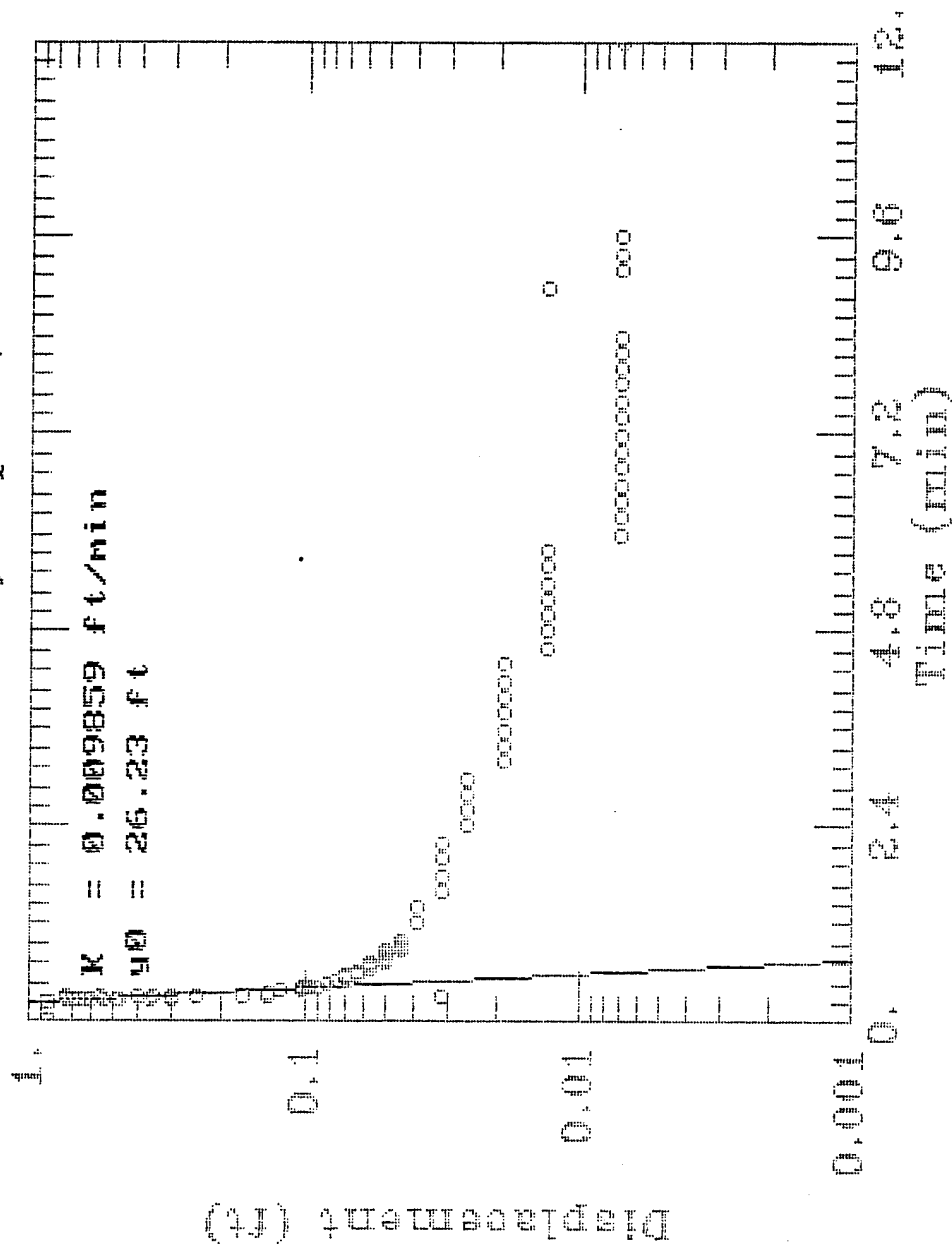
SITE 1 MONITORING WELL #3 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.2866	0.281	1
0.29	0.051	1
0.2933	0.0759996	1
0.2966	0.0129999	1
0.3	0.0640005	1
0.3033	0.096	1
0.3066	0.0640005	1
0.31	0.096	1
0.3133	0.102	1
0.3166	0.07	1
0.32	0.147	1
0.3233	0.108	1
0.3266	0.0249999	1
0.33	0.07	1
0.3333	0.096	1
0.35	0.0759996	1
0.3666	0.0569995	1
0.3833	0.096	1
0.4	0.0640005	1
0.4166	0.0319999	1
0.4333	0.00599989	1
0.45	0.07	1
0.4666	0.0569995	1
0.4833	0.121	1
0.5	0.0829996	1
0.5166	0.0759996	1
0.5333	0.07	1
0.55	0.07	1
0.5666	0.338	1
0.5833	0.185	1
0.6	-0.115	1
0.6166	0.523	1
0.6333	0.0640005	1
0.65	0.147	1
0.6666	0.0640005	1
0.6833	0.0640005	1
0.7	0.0640005	1
0.7166	0.0640005	1
0.7333	0.0640005	1
0.75	0.0640005	1
0.7666	0.0640005	1
0.7833	0.0640005	1
0.8	0.0640005	1
0.8166	0.0640005	1
0.8333	0.0640005	1
0.85	0.0640005	1
0.8666	0.0640005	1
0.8833	0.0640005	1
0.9	0.0640005	1
0.9166	0.0640005	1
0.9333	0.0640005	1
0.95	0.0640005	1

SITE 1 MONITORING WELL #3 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.9666	0.0640005	1
0.9833	0.0640005	1
1	0.0640005	1
1.2	0.0640005	1
1.4	0.0640005	1
1.6	0.0569995	1
1.8	0.0569995	1
2	0.0569995	1
2.2	0.051	1
2.4	0.051	1
2.6	0.051	1
2.8	0.00599989	1
3	0.0129999	1
3.2	0.0129999	1
3.4	0.0129999	1
3.6	0.00599989	1
3.8	0.00599989	1
4	0.00599989	1
4.2	0.00599989	1
4.4	0.00599989	1
4.6	0.00599989	1
4.8	0.00599989	1
6.2	-0.0059996	1
6.4	-0.0069996	1
6.6	-0.0069996	1
6.8	-0.0069996	1
7	-0.0069996	1
7.2	-0.0069996	1
7.4	-0.0069996	1
7.6	-0.0069996	1
7.8	-0.0069996	1
8	-0.0069996	1
8.2	-0.0069996	1

# 1mw2in / Alpena, MI



SITE 1 MONITORING WELL #2 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.26	0.849	1
0.2633	0.728	1
0.2666	0.472	1
0.27	0.594	1
0.2733	0.632	1
0.2766	0.728	1
0.28	0.651	1
0.2833	0.696	1
0.2866	0.536	1
0.29	0.364	1
0.2933	0.479	1
0.2966	0.3	1
0.3	0.555	1
0.3033	-0.166	1
0.3066	0.249	1
0.31	0.0319995	1
0.3133	0.134	1
0.3166	0.351	1
0.32	0.3	1
0.3233	0.721	1
0.3266	0.402	1
0.33	-0.108	1
0.3333	0.166	1
0.35	-0.0889998	1
0.3666	0.134	1
0.3833	0.121	1
0.4	0.102	1
0.4166	0.102	1
0.4333	0.0959997	1
0.45	0.0900001	1
0.4666	0.0830001	1
0.4833	0.0830001	1
0.5	0.0769996	1
0.5166	0.0769996	1
0.5333	0.0699996	1
0.55	0.0699996	1
0.5666	0.0699996	1
0.5833	0.0640001	1
0.6	0.0640001	1
0.6166	0.0640001	1
0.6333	0.0640001	1
0.65	0.0579996	1
0.6666	0.0579996	1
0.6833	0.0579996	1
0.7	0.0579996	1
0.7166	0.0579996	1
0.7333	0.0579996	1
0.75	0.0509996	1
0.7666	0.0509996	1
0.7833	0.0509996	1
0.8	0.0509996	1
0.8166	0.0509996	1

SITE 1 MONITORING WELL #2 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.8333	0.0509996	1
0.85	0.0509996	1
0.8666	0.045	1
0.8833	0.0509996	1
0.9	0.045	1
0.9166	0.045	1
0.9333	0.045	1
0.95	0.045	1
0.9666	0.045	1
0.9833	0.045	1
1	0.045	1
1.2	0.0390005	1
1.4	0.0390005	1
1.6	0.0319995	1
1.8	0.0319995	1
2	0.0319995	1
2.2	0.0319995	1
2.4	0.026	1
2.6	0.026	1
2.8	0.026	1
3	0.026	1
3.2	0.019	1
3.4	0.019	1
3.6	0.019	1
3.8	0.019	1
4	0.019	1
4.2	0.019	1
4.4	0.019	1
4.6	0.0130004	1
4.8	0.0130004	1
5	0.0130004	1
5.2	0.0130004	1
5.4	0.0130004	1
5.6	0.0130004	1
5.8	0.0130004	1
6	0.00699992	1
6.2	0.00699992	1
6.4	0.00699992	1
6.6	0.00699992	1
6.8	0.00699992	1
7	0.00699992	1
7.2	0.00699992	1
7.4	0.00699992	1
7.6	0.00699992	1
7.8	0.00699992	1
8	0.00699992	1
8.2	0.00699992	1
8.4	0.00699992	1
9	0.0130004	1
9.2	0.00699992	1
9.4	0.00699992	1
9.6	0.00699992	1

SITE 1 MONITORING WELL #2 (SLUG IN)

TIME (Min)	DRAWDOWN (ft)	WEIGHT
12	0.00699992	1



**Appendix C: Soil Boring Logs, Monitoring Well  
Construction Forms and Geotechnical Results**



**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

**Name of Borehole or Well:** PBG1

Sheet 1 of 1

Borehole Location: <b>Background--north side.</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/9/93</b>		Date Completed: <b>8/9/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: <b>12.0</b> Depth (ft)		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>4</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>11.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>This is a background borehole. Borehole abandoned with Hole Plug.</b>		Logged By:  <b>J Briegel</b>		Checked By:  <b>P Lay</b>	

[illegible]

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **BG2**

Sheet **1** of **1**

Borehole Location: <b>Background</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/15/93</b>	Date Completed: <b>8/15/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>2</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>2.5</b>		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface with cement/bentonite slurry.</b>		Logged By:  <b>J Briegel</b>		Checked By:  <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			13	0758	0/0				SAND; dark brown; organic rich; with fumes.	Continuous split spoon samples.  WET at 2.5'.  No hydrocarbon odors noted.
			28	0803	0/0				Grading to brown; to medium to coarse, well sorted qtz/RF sand.	
5										

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1SB4

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>2.5</b>	Water Depth Elev. (ft):		
Completion Information: <b>Borehole was abandoned with Hole Plug after sampling was complete.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol
			19	0809	0/0			Topsoil for surfical 6 inches. SAND; orangeish brown; medium grained sand.	Collected double water sample volume for duplicate.
			32	0813				Grading to brown.	Collected double water sample volume for MS/MSD.
5									TD = 4'.
10									
15									

# BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI



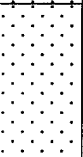
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1SB5

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>		Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>	
Drilling Equipment: <b>CME 750</b>			Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>			Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b> Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>			Water Depth (ft bgs):		Water Depth Elev. (ft):
Completion Information: <b>Borehole abandoned with Hole Plug.</b>			Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
			46	0833	0/0			AF	Artificial fill; grey sand with gravel.	Uppermost foot is artificial fill.
			40	0836	0/0			SP	SAND; brownish orange; mostly medium grained sand. Grading to light grey. Grading to orangeish brown.	
5										TD = 4'.
10										
						</				

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1SB6

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/24/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Completed:</b> <u>8/24/93</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total Depth (ft):</b> <u>4.0</u>	<b>Number of Samples:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Dist.:</b> <u>NA</u>	<b>Undist.:</b> <u>NA</u>
<b>Completion Information:</b> <u>Borehole abandoned with Hole Plug.</u>		<b>Water Depth (ft bgs):</b> <u>3.0</u>	<b>Core:</b> <u>NA</u>
		<b>Water Depth Elev. (ft):</b>	<b>Logged By:</b> <u>D Jayne</u>
			<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol
			38	0848				AF	Artificial fill; grey sand with gravel.
			64	0854				SP	SAND; light grey; medium grained sand. Grading to light brown to grey.
5									
10									
15									
									TD = 4'.

TD = 4'.

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI




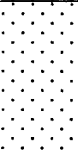
**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1SB7

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <b>Site 1</b>		<b>Elevation and Datum (ft):</b> <b>Ground:</b>	
<b>Drilling Agency:</b> <b>Stearns</b>		<b>Driller:</b> <b>D. Giffels</b>	<b>Top of Casing:</b>
<b>Drilling Equipment:</b> <b>CME 750</b>		<b>Date Started:</b> <b>8/24/93</b>	<b>Date Completed:</b> <b>8/24/93</b>
<b>Method of Drilling:</b> <b>Hollow Stem Augers</b>		<b>Total:</b> <b>4.0</b>	<b>Depth to Bedrock (ft):</b> <b>NA</b>
<b>Borehole Size (inches):</b> <b>8.25"</b>		<b>Number of Samples:</b>	<b>Dist.: NA</b>
<b>Completion Information:</b> <b>Borehole abandoned with Hole Plug.</b>		<b>Undist.: NA</b>	<b>Core: NA</b>
		<b>Water Depth (ft bgs):</b> <b>3.0</b>	<b>Water Depth Elev. (ft):</b>
		<b>Logged By:</b>	<b>Checked By:</b>
		<b>D Jayne</b>	<b>J Briegel</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			31	0905				AF	Artificial fill; grey sand with gravel.	Wet at 3'.  TD = 4'.
			48	0908				SP	SAND; light grey; medium grained.	
5										
10										
15										
20										

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI


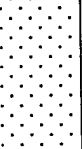
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1SB8

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>3.0</b>	Water Depth Elev. (ft):		
Completion Information: <b>Borehole abandoned with Hole Plug.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			18	0933				AF	Artificial fill; Dark brown topsoil.	Wet at about 3'.  TD = 4'.
			34	0935				SP	SAND; light brown; medium grained sand.	
									Grading to reddish brown.	
5										
10										
15										
20										

Wet at about 3'.

TD = 4'.

## BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1SB9

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>		Date Completed: <b>8/24/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs):		Water Depth Elev. (ft):	
Completion Information: <b>Borehole abandoned with Hole Plug.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
		32	0946	0/0			AF	Artificial fill.
		54	0952				SP	SAND; light brown; medium grained, well-sorted sand. Grading to light grey with thin clay layers.
5								No water level data collected.
10								
15								
20								

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1SB10

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/24/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Completed:</b> <u>8/24/93</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total Depth (ft):</b> <u>4.0</u>	<b>Number of Samples:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Dist.:</b> <u>NA</u>	<b>Undist.:</b> <u>NA</u>
<b>Completion Information:</b> <u>Borehole abandoned with Hole Plug.</u>		<b>Water Depth (ft bgs):</b> <u>3.0</u>	<b>Core:</b> <u>NA</u>
		<b>Water Depth Elev. (ft):</b>	<b>Logged By:</b> <u>D Jayne</u>
		<b>Checked By:</b> <u>J Briegel</u>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			20	1005	0/0			AF	Artificial fill; topsoil.	No field screen samples collected.
			36	1008				SP	SAND; greyish brown; medium grained sand.	
									Grading to light brown.	Wet at about 3'.
5										TD = 4'.
10										
15										
20										

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI


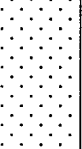
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1SB11

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>3.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole abandoned with Hole Plug.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
			62	1034				AF	Asphalt; 6 inches thick at surface. Artificial fill beneath asphalt.	No field screen.  Wet at about 3'.
			63	1038				SP	SAND; brown; medium grained sand.  Grading to greyish.  Grading back to brown sand.	
5										TD = 4'.
10										
15										TD = 4'.
20										TD = 4'.

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**



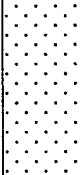
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1SB12**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>		Date Completed: <b>8/24/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>1.5</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole abandoned with Hole Plug.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/T/B*	FID (ppm) S/T/B*			Graphic Symbol	USCS
			13	1055			 	AF  SP	Artificial fill; topsoil for surficial 4 inches. SAND; greyish brown; medium grained sand.	Bohehole situated in ditch.  Wet at about 1.5'. Used only one SS sampler on this hole because water was so high.
5										TD = 4'.
10										
15										

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

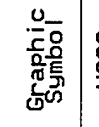
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1PZ1**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/23/93</b>		Date Completed: <b>8/23/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>8.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>0</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>4.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Completed as a piezometer. Abandoned 9/12/93 with Hole Plug. See piezometer construction log.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>J Briegel</b>	

Depth (feet)	Samples				Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
5					80/0			SP	SAND; light brown; medium grained; moist.  Same as above.	Not sampled with split spoon.  Auger cuttings noted to have hydrocarbon odor. PID reads 80ppm.  Screened from 3' to 8'.  Applied filter pack from 2' to 8'.
10										TD = 8'.
15										
20										

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1PZ2

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Top of Casing:</b>	
<b>Driller:</b> <u>D. Giffels</u>		<b>Date Started:</b> <u>8/23/93</u>	<b>Date Completed:</b> <u>8/23/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>8.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>0</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Completed as a piezometer. Abandoned 9/12/93 with Hole Plug. See piezometer construction log.</u>		<b>Logged By:</b> <u>D Jayne</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
5				60/0			SP	SAND; light brown; medium grained.	Not sampled with split spoons.  Hydrocarbon odors noted on cuttings. PID reads 60 ppm.
10									
15									
20									TD = 8'.

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1PZ3**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/23/93</b>	Date Completed: <b>8/23/93</b>		
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>8.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs):		Water Depth Elev. (ft):	
Completion Information: <b>Completed as a piezometer. Abandoned 12 Sep 93 with Hole Plug. See piezometer construction log.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
5						SP		Asphalt pavement at surface; 6" thick. SAND; light brown; medium grained.	No split spoon samples taken.  No hydrocarbon odors noted from cuttings. No readings on PID.  Field screen sample collected 8/24/93 with bailer: P1PZ3.
10									TD = 8'.
15									
20									

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW1

Sheet 1 of 2

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>		
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>40</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>2.5</b>	Water Depth Elev. (ft):		
Completion Information: <b>This borehole was completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS		
	7		1353		.5/0					
	20		1357		0/01					
5	9		1401		0/0			SP		
			1420							
	8		1422		.5/0					
10	10		1425		.7/0			CL		
	4		1429		.1/0			SP		
	4		1433		0/0			CL		
15			1435		0/0					
	14		1455		0/0			SC		
20	9		1459		0/0					
	31		1503		0/0					
25	29		1511		0/0			SP		
	46		1515		0/0					
	51		1518		0/0					

## BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW1

Sheet 2 of 2

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS		
				1523				Grading to fine to medium sand; to reddish brown from greyish; with some fine gravel.		
	108		1550							Hydropunch sample taken from 30'-32' level.
35	56		1606					SAND; greyish brown with some reddish layers; fine to coarse sand; with fine gravel; stiff.		
	20		1612					Grading with more gravel and gravelly layers.		Wanted to sample with Shelby tube at 38', but no clay layer.
	15		1620					CLAYEY SAND/SANDY CLAY; grey.		
40										Hydropunch sample taken from 38'-40' level.
										TD = 40.2'; limestone bedrock at bottom of borehole.
45										
50										
55										
60										
65										
70										

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW2

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/26/93</b>		Date Completed: <b>8/27/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>13</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>7.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>This borehole was completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By:  <b>M Stoker</b>		Checked By:  <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*			
			22	1615	0/0				Topsoil; dark brown; Sand with grass roots for surficial 6". SAND; greyish; mostly fine to medium grained.
5				1634				SP	Same as above.
			4	1637	0/0				Same as above.
10								CH	SILTY CLAY; grey; plastic.
15									
20									
25									
30									TD = 13'.

# BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW3

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/26/93</b>	Date Completed: <b>8/27/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>13</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>6.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>This borehole was completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>M Stoker</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
15	15		1653		0/0			GP	GRAVEL; Artificial fill at surface for 1 foot.
5									SAND.
10								SP	SAND.
	6		1740		0/0			CL	SAND.
									CLAY/SILTY CLAY; grey; plastic.
15									
20									
25									
30									

Hydropunch sample at 7'.

TD = 13'.



# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800Name of Borehole or Well: S1MW4

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/27/93</b>	Date Completed: <b>8/27/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>13</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>3.0</b>	Water Depth Elev.(ft):		
Completion Information: <b>Borehole was completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>J Briegel</b>	

[illegible]



## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**



Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1MW5**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/28/93</b>		Date Completed: <b>8/28/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>3</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>2.5</b>		Water Depth Elev. (ft):	
Completion Information: <b>This borehole was abandoned. No Monitoring Well was installed.</b>		Logged By:  <b>J Briegel</b>		Checked By:  <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol			
			7	0829	0/0			SP	SAND; dark brown; medium to coarse grained quartzose sand; well sorted.	Augered from surface to 1'.  Wet at 2.5'. TD = 3'. Did not drill/drive past 3'.  Hydropunch sample taken between 3'-7'.
5										
10										
15										
20										
25										
30										

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW6

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft): <b>Ground:</b>	
		Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/28/93</b>	Date Completed: <b>8/28/93</b>
Drilling Equipment: <b>CME 750</b>		Total: <b>13</b>	Depth to Bedrock (ft): <b>NA</b>
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>
		Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>2.0</b>	Water Depth Elev.(ft):
Completion Information: <b>Borehole was completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>J Briegel</b>	Checked By: <b>P Lay</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
5	17		1043		0/0			SP	
			1100						
10	7		1645					CL	
15									
20									
25									
30									

SAND; dark brown to brown; medium to coarse grained sand.

Same as above, but wet.

CLAY; grey; plastic; with sand; with slight hydrocarbon odor.

Hydropunch sample taken between 3'-7' level.

Augered to 13'.  
TD = 13'.

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI


**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1MW7

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Started:</b> <u>8/28/93</u>	
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Date Completed:</b> <u>8/28/93</u>	
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Total: Depth (ft)</b> <u>3</u>	
<b>Completion Information:</b> <u>Borehole was abandoned with Hole Plug and cuttings.</u>		<b>Depth to Bedrock (ft):</b> <u>NA</u>	
<b>Water Depth: (ft bgs)</b> <u>1.5</u>		<b>Number of Samples:</b> <u>NA</u> <u>2</u>	
<b>Logged By:</b> <u>J Briegel</u>		<b>Dist.:</b> <u>NA</u>	
<b>Checked By:</b> <u>P Lay</u>		<b>Undist.:</b> <u>NA</u>	
<b>Core:</b> <u>NA</u>		<b>Water Depth Elev.(ft):</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
			15	1112	0/0			SP	SAND; brown; coarse grained sand.
5									
10									
15									
20									
25									
30									

Wet at 1.5'.  
  
TD = 3'. No  
augering/driving split  
spoon past 3'.  
Hydropunch sample taken  
at 3'-7' level.

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW8

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/28/93</b>	Date Completed: <b>8/29/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>13</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>2.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole abandoned after caving in, filled with Hole Plug to surface.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS		
5				1318				SAND; brown. Very moist to wet.		Wet at 2'.
								SP		No hydrocarbon odors this shallow.
	6			1632				CLAYEY SAND/SANDY CLAY; grey; with fine to medium grained sand; moderately stiff to stiff; moist; slight odor.		Hydropunch sample from 3'-7'. 8/28/93
10	4			1634				CH/SC		8/29/93
	4			1637				CH		Fine to medium grained sand stringer from 8.2' to 8.4'. Strong hydrocarbon odor.
15										TD = 13'.
20										
25										
30										

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1MW9**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft): <b>Ground:</b>	
Drilling Agency: <b>Stearns</b>		Driller: <b>D. Giffels</b>	Date Started: <b>8/28/93</b>
Drilling Equipment: <b>CME 750</b>		Date Completed: <b>8/28/93</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Total Depth (ft): <b>13</b>	Depth to Bedrock (ft): <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Number of Samples: <b>2</b>	Dist.: <b>NA</b>
		Water Depth: (ft bgs) <b>2.0</b>	Undist.: <b>NA</b>
		Core: <b>NA</b>	
Completion Information: <b>Completed as a monitoring well. Well was abandoned soon after sampling. See monitoring well construction log.</b>		Logged By: <b>J Briegel</b>	Checked By: <b>J Briegel</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
5				1350				SP	
				1407					
10				1612				CH	
15									
20									
25									
30									

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1MW10

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/29/93</u>	<b>Date Completed:</b> <u>8/29/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>17</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs):</b> <u>1.5</u>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Borehole completed as monitoring well. Casing pulled and hole grouted on 9/12/93 to surface. See monitoring well construction log.</u>		<b>Logged By:</b> <u>J Briegel/D Jayne</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
				1342				SP	
5			5	1402	0/0			SC	
			4	1418	0/0			SC/CL	
			3	1425				SP	
10			1	1435	0/0			CL	
			1	1445				CH	
15			1	1510				SP	
				1527					
20									
25									
30									

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1MW11**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/29/93</b>	Date Completed: <b>8/29/93</b>		
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>15</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>2.0</b>	Water Depth Elev. (ft):		
Completion Information: <b>Borehole completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>P Lay</b>		Checked By: <b>D Jayne</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol				USCS
5			7	1705				OH	CLAY; organic clay of medium to high plasticity.		Wet at about 2'.  Augered from 3'-7' without recording lithology.  Hydropunch sample taken from 12'-16'.  TD = 15'.
							SP	SAND; light brown; fine to medium grained sand; very moist to wet.			
			2	1710				SC	CLAYEY SAND; grey; with 2"-3" sand stringer; moist.		
			5	1712					Grading to CLAYEY SAND/SANDY CLAY;		
				1715				CH	CLAY; grey; with trace of sand; slightly moist to moist.		
10				1720					CLAY; grey; with trace of sand; slightly moist to moist.		
15									Grading with silt and trace of fine sand.		
20											
25											
30											

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW12

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>9/8/93</b>		Date Completed: <b>9/8/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>15</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>5.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>P Lay/D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
				1050					
5	4		1100					SP	
	6		1105						
10	4		1110						
	4		1112					CH	
	4		1120						
15									
20									
25									
30									

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

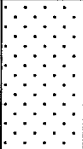
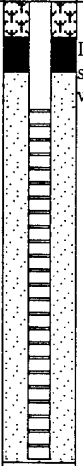




Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1MW13**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>9/8/93</b>	Date Completed: <b>9/10/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>15</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>5.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type Blow Count Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS			
5		1515				SP	SAND; reddish brown; medium grained.		Drove hydropunch from surface to 6'; collected water sample.  Wet at about 5'.
	6	1543				CL	Same as above.		
10	6	1546				CL	SANDY CLAY; dark grey; with medium grained sand.		
	5	1550				CH	CLAY; dark grey; medium stiff; highly plastic.		
15		1553				CL	SANDY CLAY; with medium sand.		
20									TD = 15'.
25									
30									

30

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1MW14

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>9/11/93</u>	<b>Date Completed:</b> <u>9/12/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>30</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs)</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Installed a 30' deep monitoring well, with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>D Jayne</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS		
5								SP		See log of S1MW6 for detailed description of shallow lithology.
10								CH		
15								SP		Augered from surface to 14.5' with 14.25" augers, then continued with 8.25" augers to TD at 30'.
20										
25				0825				SP?		Drove hydropunch from 20'-26'; collected water sample.  May have hit sand at 23 feet, according to driller's remarks.
30										

TD = 30'.

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

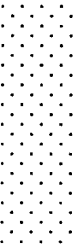
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1MW15**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>9/11/93</b>	Date Completed: <b>9/11/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>7</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs)		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By:  <b>J Briegel</b>		Checked By:  <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS		
5			4	1413	0/0			SP?		Soil not described 0'-5'.
								SP		SAND; brown; medium to coarse grained, well-sorted, quartzose sand; wet.
10										
15										
20										
25										
30										

Augered from surface to 5 feet deep without recording lithology.

TD = 7'. Drove hydropunch down from 7'-10' and collected water.

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



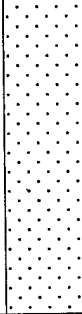
**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB2-A

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 2 (Motor Pool)</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/14/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Completed:</b> <u>8/14/93</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total Depth (ft):</b> <u>8.0</u>	<b>Number of Samples:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Dist.:</b> <u>NA</u>	<b>Undist.:</b> <u>NA</u>
<b>Completion Information:</b> <u>First of two boreholes named MP2SB2. Grouted to surface with bentonite.</u>		<b>Water Depth (ft bgs):</b> <u>NA</u>	<b>Water Depth Elev. (ft):</b> <u>NA</u>
<b>Logged By:</b> <u>J Briegel</u>		<b>Checked By:</b> <u>P Lay</u>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
5			54	0736	.5/0			AF	Asphalt topping 6" thick. Artificial fill: brown; sand with gravel.	Asphalt at the surface, underlain by sand/gravel subbase.
			33	0743	.5/0			SP	SAND; mottled brown and orange brown; medium to coarse sand; with trace of fines; loose; slightly moist.	Hydrocarbon odors not detected.
			25	0748	.2/0					
			26	0755	.1/0					
10										Duplicate soil sample collected. TD = 8'.
15										

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**



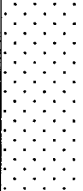
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **MP2SB2-B**

Sheet **1** of **1**

Borehole Location: <b>Site 2 (Motor Pool)</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/17/93</b>		Date Completed: <b>8/17/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>5.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs):		Water Depth Elev. (ft):	
Completion Information: <b>Second of two boreholes named MP2SB2. Grouted to surface.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			55	1634	.4/0			AF	Artificial fill; sand with gravel.	Re-drill of earlier borehole (MP2SB2-A).
			40	1641				SP	SAND; brown to dark brown. Grading to grey.  SAND; brownish orange; medium grained sand.	
5									TD = 5'.	
10										
15										

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI



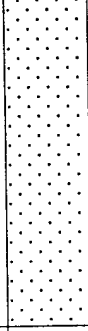
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: MP2SB3

Sheet 1 of 1

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/14/93</b>		Date Completed: <b>8/14/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>8.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>6.5</b>		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface after sampling accomplished.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	TD (ppm)	FID (ppm) S/J/B*			Graphic Symbol	USCS
			27	0825				AF	6" of asphalt at surface.	6" of asphalt at surface.
									Artificial fill; light grey, medium grained sand.	
			28	0830	.5/0				SAND; light grey; medium grained sand.	PO2B30103 collected as duplicate.
			28	0835	.5/0			SP	Grading to light brown.	
5			15	0845	.1/0				Grading to with clay; moist.	Wet at 6.5'. No fixed base sample collected.
										TD = 8'.
10										
15										
20										

6" of asphalt at surface.

PO2B30103 collected as duplicate.

Wet at 6.5'.

No fixed base sample collected.

TD = 8'.

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**



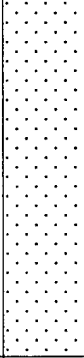
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **MP2SB4-A**

Sheet **1** of **1**

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/14/93</b>	Date Completed: <b>8/14/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>8.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>6.5</b>		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface after sampling done. Hole was re-drilled later.</b>		Logged By:  <b>J Briegel</b>		Checked By:  <b>P Lay</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
5			25	0909	.5/0			AF	Asphalt pavement at surface for 6".	No sample had noticable hydrocarbon odors.
			34	0913	4.7/0				SAND; brown to orange brown; medium to coarse grained, well-sorted, sand; slightly moist.	
			22	0919	.5/0			SP		
			18	0923	.1/0				Color change to light brown.	
									Grading to coarse to very coarse sand.	
10										Water at 6.5'.
										Field screen only run on water.
15										TD = 8'.

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB4-B

**Sheet** 1 **of** 1

<b>Borehole Location:</b> Site 2		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 8/17/93	<b>Date Completed:</b> 8/17/93
<b>Drilling Equipment:</b> CME 750		<b>Total: Depth (ft)</b> 5.0	<b>Depth to Bedrock (ft):</b> NA
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b>	<b>Dist.:</b> NA
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> Grouted to surface after sampling done. Hole was re-drill from earlier one.		<b>Logged By:</b> D Jayne	<b>Checked By:</b> P Lay

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS
	46		1725		0/0			
	30		1733		0/0			
5								
10								
15								
20								

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



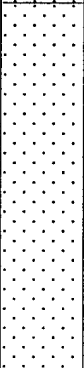
**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB5-A

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 2</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
		<b>Top of Casing:</b>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/14/93</u>	<b>Date Completed:</b> <u>8/14/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>8.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b>	<b>Dist.:</b> <u>NA</u>
		<b>Undist.:</b> <u>NA</u>	<b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth (ft bgs):</b> <u>6.5</u>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Grouted to surface after sampling done. Hole was re-drilled later.</u>		<b>Logged By:</b> <u>J Briegel</u>	<b>Checked By:</b> <u>P Lay</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
5			39	0950	0/0			AF	Asphalt at surface; underlain by sandy gravel base.	No sample had noticable hydrocarbon odors.
			32	0955	0/0				SAND; dark brown/orange; with clay layer; moist.	
			34	1000	0/0			SP	Grading to light grey.	
			13	1005	0/0				Grading slightly finer grained.	
10									Water at 6.5'. Field screen only run on water.	
15									TD = 8'.	

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI


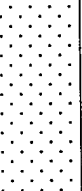
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: MP2SB5-B

Sheet 1 of 1

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/17/93</b>	Date Completed: <b>8/17/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>5.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs):		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface after sampling done. Hole was re-drill from earlier one.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			40	1657	.3/0			AF	Artificial fill; sand with gravel.	This is a re-drill of MP2SB5-A.
			25	1702	0/0			SP	SAND; brownish orange; medium grained sand.	No water encountered; no hydrocarbon odors detected.
5										TD = 5'.
10										
15										
20										

## BORING LOG

Project Name: **MI ANG, Alpena CRTS - Alpena, MI**




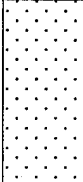
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **MP2SB6**

Sheet **1** of **1**

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/15/93</b>	Date Completed: <b>8/15/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>6.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>5.5</b>		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface with cement/bentonite mixture.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
5			49	1019	0/0			AF	Artificial fill; 2.5 feet of topsoil and fill; brown; sand and gravel; with organic debris; loose; dry.	No field screen done on samples.
			32	1026	0/0					Base of fill at 2.5'.
			31	1033	0/0			SP	SAND; light brown to orange brown; medium to coarse grained, quartz sand; loose; slightly moist.	No hydrocarbon odors detected while drilling/sampling. Wet at 5.5'.
10										TD = 6'.
15										
20										
25										
30										
35										
40										
45										
50										
55										
60										
65										
70										
75										
80										
85										
90										
95										
100										

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI




**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB7

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 2</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	<b>Date Completed:</b> <u>8/15/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Started:</b> <u>8/15/93</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total Depth (ft):</b> <u>6.0</u>	<b>Number of Samples:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth (ft bgs):</b> <u>6.0</u>	<b>Dist.: NA</b>
<b>Completion Information:</b> <u>Grouted to surface with cement/bentonite mixture.</u>		<b>Undist.: NA</b>	<b>Core: NA</b>
<b>Logged By:</b> <u>J Briegel</u>		<b>Checked By:</b> <u>P Lay</u>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
5			22	1056				AF	Artificial fill; topsoil covering gravelly sand.	Wet at about 6'. TD = 6'.
			32	1101					SAND; mottled orange brown and brown; medium to coarse sand; loose; moist.	
			24	1106				SP	Grading to light brown; to mostly fine to medium grained sand.	
10										
15										

Wet at about 6'.

TD = 6'.



# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

Project Number: 931800

Name of Borehole or Well: MP2SB8

Sheet 1 of 3

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/15/93</b>		Date Completed: <b>8/15/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>58.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>6.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface with cement/bentonite slurry.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>P Lay</b>	

[illegible]

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: MP2SB8

Sheet 2 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol		
25								SP	Same as above.
30								SP	Same as above.
35								SP	Same as above.
40									
45									Same as above.



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## BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: MP2SB8

Sheet 3 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol		
50									
52	52		1321						
55			1405						
54'-56'								Same as above.	Field screen done on 54'-56' sample.
56'-58'								CLAY; with trace of sand; medium stiff; plastic.	Shelby Tube sampler for 56'-58'.
60									
65									
70									
									TD = 58'.

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**



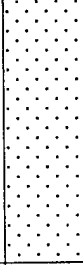
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **MP2SB9**

Sheet **1** of **1**

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/16/93</b>	Date Completed: <b>8/16/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>6.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs):		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface with cement/bentonite slurry.</b>		Logged By: <b>P Lay</b>		Checked By: <b>D Jayne</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
5			31	1510	.4/0			AF	Asphalt 2" thick; underlain by gravel with sand to depth of 1 foot.	GC sample collected.  Soil sample (and duplicate) collected.
			34	1517	.2/0			SP	SAND; brownish yellow (10YR 6/6); sand fine grained; no odor; slightly moist.	
			26	1524	.1/0					
10										TD = 6'.
15										

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**










Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **MP2MW6**

Sheet **1** of **2**

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/16/93</b>		Date Completed: <b>8/16/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>42</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>9.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*				Graphic Symbol
			10	0827				AF	Artificial fill; dark brown; organic-rich topsoil.	Collected soil samples and water samples periodically.
			8	0833				SP	SAND; olive yellow (2.5Y 6/8); medium grained, quartz-rich, sand.	
5								SP	Grading to pale yellow (2.5Y 7/4).	Hydropunch sample taken between 9'-14'.
10									Grading to gray.	
								SC	CLAY.	
15			28	0915					With CLAYEY SAND lenses.	
								GW	GRAVEL; well-graded gravel; with sand.	Field screen sample only.
20			54	0921				SP	Coarse sand.	Field screen sample only.
25									SAND.	Hydropunch sample taken between 24'-28'.
30										



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## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: MP2MW6

Sheet 2 of 2

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PTD (ppm) S/B*	FTD (ppm) S/B*			
35									
40			42	1007					
45									
50									
55									
60									
65									
70									

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI




**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2MW7

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <b>Site 2</b>		<b>Elevation and Datum (ft):</b> <b>Ground:</b>	
		<b>Top of Casing:</b>	
<b>Drilling Agency:</b> <b>Stearns</b>	<b>Driller:</b> <b>D. Giffels</b>	<b>Date Started:</b> <b>8/17/93</b>	<b>Date Completed:</b> <b>8/17/93</b>
<b>Drilling Equipment:</b> <b>CME 750</b>		<b>Total Depth (ft):</b> <b>15</b>	<b>Depth to Bedrock (ft):</b> <b>NA</b>
<b>Method of Drilling:</b> <b>Hollow Stem Augers</b>		<b>Number of Samples:</b> <b>NA</b>	<b>Dist.:</b> <b>NA</b>
		<b>Undist.:</b> <b>NA</b>	<b>Core:</b> <b>NA</b>
<b>Borehole Size (inches):</b> <b>8.25"</b>		<b>Water Depth: (ft bgs):</b> <b>7.0</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		<b>Logged By:</b> <b>D Jayne</b>	<b>Checked By:</b> <b>P Lay</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*				Graphic Symbol
			34	1742	0/0			AF	Artificial fill; SAND with gravel.	
									SAND; orange-brown; medium grained.	Field screen sample.
5			14	1746	0/0			SP		Field screen sample.
									Same as above.	Wet at about 7'.
10										
15										TD = 15'.
20										
25										

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI


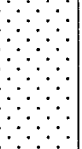
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: MP2SB10

Sheet 1 of 1

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>NA</b>	Driller: <b>D. Jayne</b>	Date Started: <b>9/13/93</b>	Date Completed: <b>9/13/93</b>		
Drilling Equipment: <b>AMS Soil Auger</b>		Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hand Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>3"</b>		Water Depth (ft bgs):		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
				0917				AF	Artificial fill; gravelly sand/sandy gravel.	This is a hand auger borehole.
				0935				SP	SAND; orange brown; medium grained, well sorted, sand; no odor.	Collected 2 fixed base soil samples and 2 QA/QC samples.
5										TD = 4'.
10										
15										

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI





**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** CG3SB12

**Sheet** 1 **of** 1

<b>Borehole Location:</b> Site 3		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 8/26/93	<b>Date Completed:</b> 8/26/93
<b>Drilling Equipment:</b> CME 750		<b>Total Depth (ft):</b> 12.0	<b>Depth to Bedrock (ft):</b> NA
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b>	<b>Dist.:</b> NA <b>Undist.:</b> NA <b>Core:</b> NA
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> Grouted to surface with cement/bentonite slurry.		<b>Logged By:</b> M Stoker	<b>Checked By:</b> P Lay

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
5			18	0850	0/0			AF	Topsoil; dark brown; grass and roots; 4" thick.	Thin layer of topsoil present.
									SAND; orange-brown; fine sand; moist.	Gas chromatograph sample (P3SB12A).
			23	0855	0/0			SP		
										Grading to greyish brown; to fine to medium grained sand.
10			20	0900				SP		Gas chromatograph sample (P3SB12C).
			31	0905					Same as above, but dense; very moist.	Gas chromatograph sample (P3SB12D).
15										TD = 15'.

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** CG3SB13

**Sheet** 1 **of** 3

<b>Borehole Location:</b> Site 3		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 8/26/93	<b>Date Completed:</b> 8/26/93
<b>Drilling Equipment:</b> CME 750		<b>Total Depth (ft):</b> 55.0	<b>Depth to Bedrock (ft):</b> NA
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b>	<b>Dist.:</b> NA
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b> 13.5	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> Installed a temporary piezometer (CG3PZ2), which was pulled out 9/12/93 and grouted with Hole Plug. See piezometer construction log.		<b>Logged By:</b> M Stoker	<b>Checked By:</b> P Lay

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			20	1110	0/0			AF	Topsoil; dark brown; with grass and roots; 6" deep.	Gas chromatograph sample (P3SB13A).
									SAND; orange brown; fine to medium sand; moist.	
5			24	1115	0/0			SP	SAND; orange brown; fine, rounded sand; moist.	Gas chromatograph sample (P3SB13B).
			19	1119	0/0				Same as above.	Gas chromatograph sample (P3SB13C).
10			18		0/0					Gas chromatograph sample (P3SB13D).
			79		0/0				Grading to with trace of fine gravel; wet.	Gas chromatograph sample (P3SB13E).
15								SP		Collect hydropunched sample at 17'.
									Same as above.	
20										

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3SB13

Sheet 2 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS	
25								SP	Same as above.
30									Same as above.
35								SP	Same as above.
40									Same as above.
45								SP	

# BORING LOG


Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3SB13

Sheet 3 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PTD (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS	
50	29		1205	0/0					SAND; same as above. Grading to greyish brown; to fine to medium sand.  SILTY CLAY; grey; plastic.  CL  Shelby Tube sample from 53' to 55'; stiff grey clay.
	10		1218	0/0					
			1225						
55									TD = 55'.
60									
65									
70									



## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3PZ1

Sheet 1 of 2

Borehole Location: <b>Site 3</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/25/93</b>	Date Completed: <b>8/25/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft): <b>20.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>13.5</b>		Water Depth Elev. (ft):	
Completion Information: <b>Completed as a piezometer, with 2" casing. See piezometer construction log.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS	
			9	1355	0/0				
5								SP	Same as above.
10			9	1403	0/0				
15				1409	18.3/0			SP	Same as above.
20									



## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: CG3PZ1

Sheet 2 of 2

[illegible]

# BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3MW6

Sheet 1 of 2

Borehole Location: <b>Site 3</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/25/93</b>	Date Completed: <b>8/30/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>33</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>15.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
5			15	1444	.1/0			SP	SAND; brown to light brown with orange brown mottling; medium to coarse grained, quartz sand; loose; slightly moist.
10			42	1452	0/0			CL	SANDY CLAY lens.
15			42	1456	0/0			SW	SAND; brown to light brown with orange brown mottling; medium to coarse sand; loose; moist.
20								SP	Grading to with coarser sand; with trace very fine to fine gravel.
25									Wet at about 15'. Hydropunch sample 16'-18'. Lithology not recorded past 15'. No hydrocarbon odors detected in samples or cuttings. Hydropunch sample 24'-28'.
30									



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## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3MW6

Sheet 2 of 2

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol			
35										
40										
45										
50										
55										
60										
65										
70										

TD = 33'.

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI






Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3MW7

Sheet 1 of 2

Borehole Location: <b>Site 3</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/30/93</b>	Date Completed: <b>8/30/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft): <b>35</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>14.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>P Lay</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol			
								AF	Topsoil; to 1' deep.	
									SAND; light brown; fine to medium; no odor; dry to slightly moist.	
5			10	1352	0/0			SP		
			37	1358	0/0				SAND; light olive brown; no odor; with trace of fine, rounded qtz gravel.	
10										
			21	1401	0/0					
15								SP	SAND; light brown; medium to coarse, subangular sand; with trace of fine, rounded gravel.	Wet at about 14'. Hydropunch sample at 14'.
20										
25										
30										Hydropunch sample at

Wet at about 14'.  
Hydropunch sample at 14'.

Hydropunch sample at

# BORING LOG



Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3MW7

Sheet 2 of 2

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS			
29'							SP			
35'			1520							TD = 35'.  Hydropunch sample at 35'-39'.
40'										
45'										
50'										
55'										
60'										
65'										
70'										

# **BORING LOG**

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**


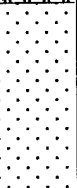



Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **TF4SB15**

Sheet **1** of **2**

Borehole Location: <b>Site 4</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/11/93</b>	Date Completed: <b>8/11/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>43.5</b>	Depth to Bedrock (ft): <b>NA</b> <b>43</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>26.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole was grouted with cement/bentonite slurry after sampling finished.</b>		Logged By: <b>J Briegel/M Stoker</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol
			27	0850	0/0			AF	Artificial fill; grassy topsoil with gravel at surface.
									SAND; brown to light brown; medium grained, well-sorted, well-rounded, sand; no odor.
5			24	0900	0/0				Grading to with trace of gravel.
								SP	
			86	0909	0/0				Grading to GRAVELLY SAND.
10									SAND; light brown to brown; medium to coarse grained quartz sand; with minor gravel.
			106	0918	0/0			SW	Same as above, but with angular to subangular RF gravel.
15									
								SP	
			104	0927	0/0				
20									

# BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: TF4SB15

Sheet 2 of 2

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol		
					</				

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI


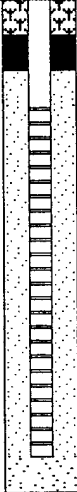







**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** SF5MW5

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 5</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/12/93</u>	<b>Date Completed:</b> <u>8/12/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>14</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs):</b> <u>5.0</u>	<b>Water Depth Elev.(ft):</b>
<b>Completion Information:</b> <u>Installed a 2" diameter monitoring well. See monitoring well construction log.</u>		<b>Logged By:</b> <p style="text-align: center;"><b>D Jayne</b></p>	<b>Checked By:</b> <p style="text-align: center;"><b>J Briegel</b></p>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*				Graphic Symbol	USCS
			12	0835				AF	Artificial fill; dark brown; topsoil with grass roots, etc.		Wet at about 5'.
								SP	SAND; orange brown; medium grained sand.		
5			1	0842					Grading to light brown.		
								CL	SANDY CLAY; light brown; moist.		
			1	0850				SP	SAND; orange brown; medium grained sand.		
10								CL	SANDY CLAY; light grey; moist.		
											
								SP	SAND.		
15											TD = 14'.
20											
25											
30											

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**









Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **SF5MW6**

Sheet **1** of **1**

Borehole Location: <b>Site 5</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/12/93</b>	Date Completed: <b>8/12/93</b>		
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>21</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>5.0</b>	Water Depth Elev.(ft):		
Completion Information: <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*				Graphic Symbol
			8	1340	0/0			AF	Artificial fill; dark brown; sand with roots, etc.	
								SP	SAND; light brown; medium grained sand.	Field screen spoon sample.
5			4	1350	0/0				SANDY CLAY; light grey; moist.	Wet at about 5'.
10			4	1355	0/0			CL	CLAY; light grey; clay with sand; saturated.	Sample not analyzed.
									SAND; light grey; sand with clay.	Lithology not described between 10' and 19'; assumed to be mostly sand.
15								SC		
20			15	1400	4/0				SAND; light grey; sand with clay.	
								SW	SAND; with clay and limestone gravel; very well-graded.	TD = 21'; limestone bedrock at bottom of borehole.
25										

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **SF5MW7**

Sheet **1** of **1**

Borehole Location: <b>Site 5</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/12/93</b>	Date Completed: <b>8/12/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>20</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: <b>6.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>D Jayne</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PTD (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
			9	1552	1.3/0			AF	Artificial fill; dark brown; sand with grass roots.
			10	1555	.9/0			SP	SAND; light brown mottled orange; medium to coarse grained quartz sand.
5			35	1602	.5/0			SP	Grading to light brown.
10								SP	Grading to brown; wet.
15								SP	Grades to greyish brown, mostly coarse sand.
				1625	.5/0			CL	Sand grading much coarser, with much gravel.
20								CL	SANDY CLAY; grey to greyish brown; soft, plastic clay with 40% sand.
25									Pushed Shelby tube 18' to 20' down; to limestone bedrock at 20'. TD = 20'; at top of bedrock.

-30-

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** SF5MW8

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 5</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/31/93</u>	<b>Date Completed:</b> <u>8/31/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>20</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u> <b>Undist.:</b> <u>NA</u> <b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs)</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Installed monitoring well, with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>J Briegel/D Jayne</u>	<b>Checked By:</b> <u>D Jayne</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol			
5								SP	SAND.	No other descriptions recorded.
10									SAND.	
15								SP	SAND.	
20			1015							TD = 20'.
25										
30										

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** SF5MW9

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 5</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
		<b>Top of Casing:</b>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>9/9/93</u>	<b>Date Completed:</b> <u>9/10/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>19</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
		<b>Undist.:</b> <u>NA</u>	<b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth (ft bgs):</b> <u>8.0</u>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Completed as a temporary monitoring well; with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>J Briegel/D Jayne</u>	<b>Checked By:</b> <u>D Jayne</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS		
5								SP		
								Same as above.		
10				1404						Collect hydropunch sample for field screen.
15				1440				SP		Collect hydropunch sample for field screen.
								Same as above.		
20										Collect hydropunch sample, and a duplicate, for field screen. TD = 19'; auger refusal at alluvium/limestone bedrock contact.
25										
30										

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

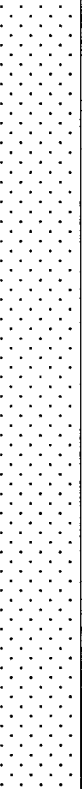
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: SF5TW10

Sheet 1 of 1

Borehole Location: <b>Site 5</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>9/10/93</b>	Date Completed: <b>9/10/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>15.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>5.0</b>	Water Depth Elev. (ft):		
Completion Information: <b>Grouted to surface with cement/bentonite.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>D Jayne</b>	

Depth (feet)	Samples				Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
5								SP	SAND; fine to medium grained; with RF.	For detailed lithologic description, see log for SF5MW6.
10								SP		
15										TD = 15'.
										Hydropunched for water sample between 15' and 17'.

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: LF6MW4

Sheet 1 of 1

Borehole Location: <b>Site 6</b>		Elevation and Datum (ft): <b>Ground:</b>	
		Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/11/93</b>	Date Completed: <b>8/11/93</b>
Drilling Equipment: <b>CME 750</b>		Total: <b>20</b>	Depth to Bedrock (ft): <b>NA</b>
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>
		Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>9.0</b>	Water Depth Elev.(ft):
Completion Information: <b>Completed as a monitoring well; with 2" diameter casing. Located at the landfill. See monitoring well construction log.</b>		Logged By: <b>J Briegel</b>	Checked By: <b>J Briegel</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*				Graphic Symbol
			8	1518	8/0			AF	Artificial fill; dark brown, organic-rich sand and gravel as topsoil.	HNU readings taken in headspace jars.
								SP	SAND; light brown to orange brown mottled; fine to medium, well-sorted quartz sand.	
5			7	1525	0/0				Grading to light brown to brown.	
									Grading to light brown.	Wet at about 9 feet.
			9	1532	0/0			CL	CLAY; brown; with minor silt and sand; plastic; saturated.	
10								SP	SAND; brown; medium to coarse sand.	
								SC	CLAYEY SAND.	
15									CLAYEY SAND.	TD = 20'.
20										
25										
30										

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **LF6MW5**

Sheet **1** of **1**

Borehole Location: <b>Site 6</b>		Elevation and Datum (ft): <b>Ground:</b>	
Drilling Agency: <b>Stearns</b>		Driller: <b>D. Giffels</b>	Date Started: <b>8/11/93</b>
Drilling Equipment: <b>CME 750</b>		Date Completed: <b>8/11/93</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Total: Depth (ft) <b>20</b>	Depth to Bedrock (ft): <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>
Completion Information: <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		Water Depth: (ft bgs) <b>15.0</b>	Undist.: <b>NA</b> Core: <b>NA</b>
		Water Depth Elev.(ft):	
		Logged By: <b>J Briegel</b>	Checked By: <b>J Briegel</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
	14		1702		0/0			AF	Topsoil; dark brown; sand with organic matter to depth of 6".
									SAND; orange brown; medium grained.
5			1709		0/0			SP	Grading to light brown to brown; medium to coarse, well-sorted, quartz sand; loose.
									Field screen sample only.
			1716						Field screen sample not analyzed.
10									Duplicate sample collected.
15								SC/CL	CLAYEY SAND/SANDY CLAY; light brown to grey; with strong fuel odor.
									Same as above.
20									
									TD = 20'.
25									
30									



The Earth Technology  
Corporation

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: LF6MW6

Sheet 1 of 2

Borehole Location: <b>Site 6</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/14/93</b>		Date Completed: <b>8/14/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>42</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>14.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By: <b>D Jayne/J Briegel</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
5	8		1410					SP	SAND; light brown; medium grained.
									Same as above.
10	11		1415						Same as above.
15	9		1420					CL	SANDY CLAY.
									CLAYEY SAND; moist.
20								SC	Same as above.
25								SC	Same as above.
30									

## BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: LF6MW6

Sheet 2 of 2

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS		
35								CLAYEY SAND; same as above.		
								SC		
								Same as above.		
								Grading to SILTY CLAYEY SAND; with fines up to 20%; with some angular, fossiliferous limestone and shale RF and gravel; mostly fine to medium grained sand.		Well TD is 33'.
	81		1445		0/0					
	29		1450		0/0					Very resistant gravelly/bouldery zone.
40								SC		
	44		1502					CL		Borehole backfilled with Hole Plug from 42' to 34'.
								CLAY; grey; stiff to moderately stiff; with limestone/shale RF and gravel.		TD = 42'.
45										
50										
55										
60										
65										
70										

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: LF6MW7

Sheet 1 of 1

Borehole Location: <b>Site 6</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/15/93</b>		Date Completed: <b>8/15/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>18</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>8.7</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as monitoring well; with 2" casing. Pulled and grouted 10 Sept 93. See monitoring well conuaction log</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
			8	1655	0/0			AF	Artificial fill; dark brown; sandy topsoil.
									SAND; light brown; medium grained.
5								SP	
			10	1702	.1/0				Grading to orange brown; to moist.
			7	1707				CL	SANDY CLAY; moist.
10			5	1710				CH	CLAY; with some sand; medium stiff.
			9	1713				SP	SAND; very coarse grained.
								CH	CLAY; medium stiff.
15			7	1718	0.0			CL	SANDY CLAY.
								CH	CLAY; medium stiff; high plasticity.
				1734					
20									
25									
30									

Field screen only.

Wet at about 8.7'.

Shelby Tube sample at 17'-18'.

TD = 18'.

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **LF6MW8**

Sheet **1** of **1**

Borehole Location: <b>Site 6</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/27/93</b>		Date Completed: <b>8/27/93</b>	
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>15</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>9.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By: <b>J Briegel/M Stoker</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
	13		1530						
5									
	6		1534						
10					85/0				
	5		1542						
			1546						
15									
20									
25									
30									

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** LF6MW9

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 6</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
		<u>Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/27/93</u>	<b>Date Completed:</b> <u>8/27/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>14</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
		<b>Undist.:</b> <u>NA</u>	<b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs)</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>M Stoker</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
			6	1650	0/0				
			13	1654	0/0				
5			13	1659	0/0				
10			6	1705	0/0				
15									
20									
25									
30									

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **LF6MW10**

Sheet **1** of **1**

Borehole Location: <b>Site 6</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>9/12/93</b>		Date Completed: <b>9/12/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>13</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>9.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By: <b>D Jayne/J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol			

# BORING LOG

**Project Name:** MI ANG, Alpena CRTS - Alpena, MI


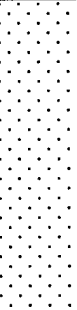
**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** HN8SB2

**Sheet** 1 **of** 3

<b>Borehole Location:</b> Site 8		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 8/13/93	<b>Date Completed:</b> 8/13/93
<b>Drilling Equipment:</b> CME 750		<b>Total: Depth (ft)</b> 59.0	<b>Depth to Bedrock (ft):</b> NA 59
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b>	<b>Dist.:</b> NA
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b> 11.5	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> Borehole grouted to surface with cement/bentonite slurry.		<b>Logged By:</b> J Briegel	<b>Checked By:</b> P Lay

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			26	0930	0/0			AF	Concrete pavement 8" thick.	Wet at 11.5'.  Augered from 13' to 54' without recording lithology.
									Artificial fill; gravel with sand to 3'.	
5			25	0939	0/0			SP	SAND; brown; medium to coarse grained, quartz/RF sand; loose; slightly moist.	
			24	0948	0/0				Grading to light brown with brown.	
10			58	1002	0/0				Grading to light brown to greyish brown; with a thin gravel layer 12'-12.5'.	
15								SP		
20										

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: HN8SB2

Sheet 2 of 3

Depth (feet)	Samples				Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
<div style="text-align: center;"> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> <div style="margin-bottom: 10px;">35</div> <div style="margin-bottom: 10px;">40</div> <div style="margin-bottom: 10px;">45</div> </div>							SP			
							SP			
							SP			



**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: HN8SB2

Sheet 3 of 3

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# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: HN8SB3

Sheet 1 of 1

Borehole Location: <b>Site 8</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/13/93</b>		Date Completed: <b>8/13/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>11.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs):		Water Depth Elev. (ft):	
Completion Information: <b>Borehole was grouted to surface with cement/bentonite.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol
5									
10									
15									
20									

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: HN8SB4

Sheet 1 of 1

Borehole Location: <b>Site 8</b>		Elevation and Datum (ft): <b>Ground: Top of Casing:</b>	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/13/93</b>	Date Completed: <b>8/13/93</b>
Drilling Equipment: <b>CME 750</b>		Total Depth (ft) <b>14.0</b>	Depth to Bedrock (ft): <b>NA</b>
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b> Undist.: <b>NA</b> Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>13.8</b>	Water Depth Elev. (ft):
Completion Information: <b>Borehole was grouted to surface with cement/bentonite.</b>		Logged By: <b>D Jayne</b>	Checked By: <b>P Lay</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol
			32	1540	1.3/0			AF	Artificial fill; 12" of black, organic-rich topsoil.
									SAND; light brown; medium grained sand.
5			27	1545	4.3/0			SP	Same as above.
			41	1550	.1/0				Grading to light grey.
10			55	1605	.1/0			SP	Same as above, but moist.
15									Water at about 13.8'. TD = 14'.

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**







Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **HN8SB5**

Sheet **1** of **1**

Borehole Location: <b>Site 8</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>		Date Started: <b>8/13/93</b>	Date Completed: <b>8/13/93</b>	
Drilling Equipment: <b>CME 750</b>			Total: Depth (ft) <b>11.0</b>	Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>			Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b> Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>			Water Depth (ft bgs):		Water Depth Elev. (ft):
Completion Information: <b>Borehole was grouted to surface with cement/bentonite.</b>			Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks			
	Number	Type	Blow Count Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS					
5			52	1645				AF	Concrete; pavement 8" thick, underlain by gravel base.	Large cobble plugged the sampler; no sample caught.		
												SAND; light brown; medium grained sand.
10			21	1650	0/0			SP	Same as above.			
15			35	1700				SP	Same as above, but moist.	Collected MS/MSD sample for lab.		
20										TD = 11'.		

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** HN8SB6

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 8</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/15/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Completed:</b> <u>8/15/93</u>	
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total Depth (ft):</b> <u>14.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Undist.: NA</b> <b>Core: NA</b>
<b>Completion Information:</b> <u>Borehole was grouted to surface with cement/bentonite.</u>		<b>Water Depth (ft bgs):</b> <u>NA</u>	<b>Water Depth Elev. (ft):</b> <u>NA</u>
		<b>Logged By:</b> <u>J Briegel</u>	<b>Checked By:</b> <u>P Lay</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
			24	0844	0/0			GW	Artificial fill; dark grey; gravelly sand with roots; to a depth of 2'.	Grassy area at surface.
								SP	SAND; light brown to brown; medium to coarse, quartz sand; with trace of gravel; loose; slightly moist.	
5			30	0849	0/0				Same as above.	
			36	0856	.1/0				Same as above, but light brown.	
10			59	0903	0/0				SAND; light brown; fine to medium grained quartz sand; with trace of fine gravel; slightly moist.	
15										No odors detected in sampling. No water at bottom of borehole.
										TD = 14'.

No odors detected in sampling.  
No water at bottom of borehole.

TD = 14'.

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**


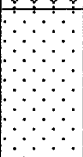
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **HN8SB7**

Sheet **1** of **1**

Borehole Location: <b>Site 8</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/15/93</b>	Date Completed: <b>8/15/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>14.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>13.0</b>	Water Depth Elev. (ft):		
Completion Information: <b>Borehole was grouted to surface with cement/bentonite.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples			Field Analysis			Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS			
			35	0930	0/0			AF	Artificial fill; brown; organic-rich topsoil.	No field screen.	
								SP	SAND; orange brown; medium grained quartz-rich sand.		
5			21	0933	0/0				Grading to light brown.		Field screen (PO8SB7B).
			27	0938	0/0				Same as above.		Field screen (PO8SB7C).
10			91	0946	0/0				Grading to with trace of gravel; saturated.	Field screen (PO8SB7D). Water came up to about 13'.	
15										TD = 14'.	
20											

# **BORING LOG**

Project Name: MI ANG, Alpena CRTC - Alpena, MI


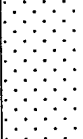
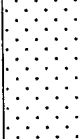
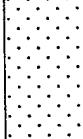
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: HN8SB8

Sheet 1 of 1

Borehole Location: <b>Site 8</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/17/93</b>	Date Completed: <b>8/17/93</b>		
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>11.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>NA</b>	Water Depth Elev. (ft):		
Completion Information: <b>Borehole was grouted to surface with cement/bentonite slurry.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			26	0849	0/0			AF	Concrete 8" thick at the surface; underlain by gravel and sand to 2.5'.	No fuel odors detected.  Thin layer of fine grained gravel from 10'-10.5'.  TD = 11'; not to water table.
5				0853	0/0			SP	SAND; orange brown to brown; medium to coarse grained quartz sand; well-sorted.	
								SP	Grading to light brown to greyish brown; to with fine gravel; loose; moist.	
10			54	0904	0/0				Grading to greyish brown.	
15										
20										

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** HN8MW5

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 8</u>		<b>Elevation and Datum (ft):</b> <u>Ground: 9999.99'</u> <u>Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>9/11/93</u>	<b>Date Completed:</b> <u>9/11/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total: Depth (ft)</b> <u>20</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs)</b> <u>12.8</u>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>J Briegel</u>	<b>Checked By:</b> <u>P Lay</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*			
5									

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **RT9SB13**

Sheet **1** of **3**

Borehole Location: <b>Site 9</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/29/93</b>		Date Completed: <b>8/29/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>61.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>16.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface with cement/bentonite slurry after drilling completed.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol
5			8	0834	0/0				
								SP	
									Same as above.
10			48	0838	0/0				
									Same as above.
15			27	0841	0/0				
								SP	
									Same as above.



# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: RT9SB13

Sheet 2 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
									SAND; same as above.	
25								SP	Same as above.	
30									SAND; light brown; medium grained sand.	
35								SP	Same as above.	
40									Same as above.	
45								SP	Same as above.	
	25		0904		0/0					

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

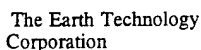
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: RT9SB13

Sheet 3 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS	
								CL	SANDY CLAY.
			54	0911	0/0				SAND; light brown; medium grained sand; with trace of clay.
50			40	0916	0/0			SP	Grading to coarser-grained.
			90	0929	0/0				SAND; same as above.
			61	0935	0/0				Same as above.
55			102	0948	0/0			SP	SAND; coarse to very coarse grained.
			76	0956	0/0				Grading to very coarse grained sand.
60			1015		0/0			CL	CLAY; grey; with sand and dark grey RF (calcareous shale).
									Clay and rock on tip of sampler; may be close to bedrock contact.
									TD = 61'.
65									
70									



# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800Name of Borehole or Well: RT9MW6

Sheet 1 of 1

Borehole Location: <b>Site 9</b>		Elevation and Datum (ft): <b>Ground: Top of Casing:</b>			
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/30/93</b>		Date Completed: <b>8/30/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>23</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>15.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a flush-mounted monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By:  <b>P Lay</b>		Checked By:  <b>D Jayne</b>	

[illegible]



## BORING LOG

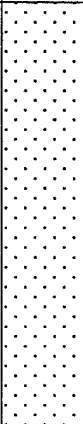
Project Name: MI ANG, Alpena CRTIC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: RT9TW7

Sheet 2 of 2

Depth (feet)	Samples				Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
25								SP	SAND.	Collected hydropunch water sample (P9TW7AW) at 21'.
30									SAND.	TD = 28'; collected hydropunch water sample (P9TW7BW) at 31'.
35										
40										
45										



# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800Name of Borehole or Well: RT9TW8

Sheet 1 of 1

Borehole Location: <b>Site 9</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>9/9/93</b>		Date Completed: <b>9/9/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>19.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>7.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Temporary monitoring well with 2" casing; pulled and grouted after sampling complete. See monitoring well construction log.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>P Lay</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol		
0									
5								SAND; reddish brown; medium grained.	
10				1404				SAND; same as above.	Water came up to 7'.  Tried to get water sample with hydropunch at 8'; but no water. Hydropunch sample P5TW9AW at 9'.
15				1440					Hydropunch sample P5TW9BW (and duplicate) collected at 18'.
									TD = 19'; may have hit bedrock.

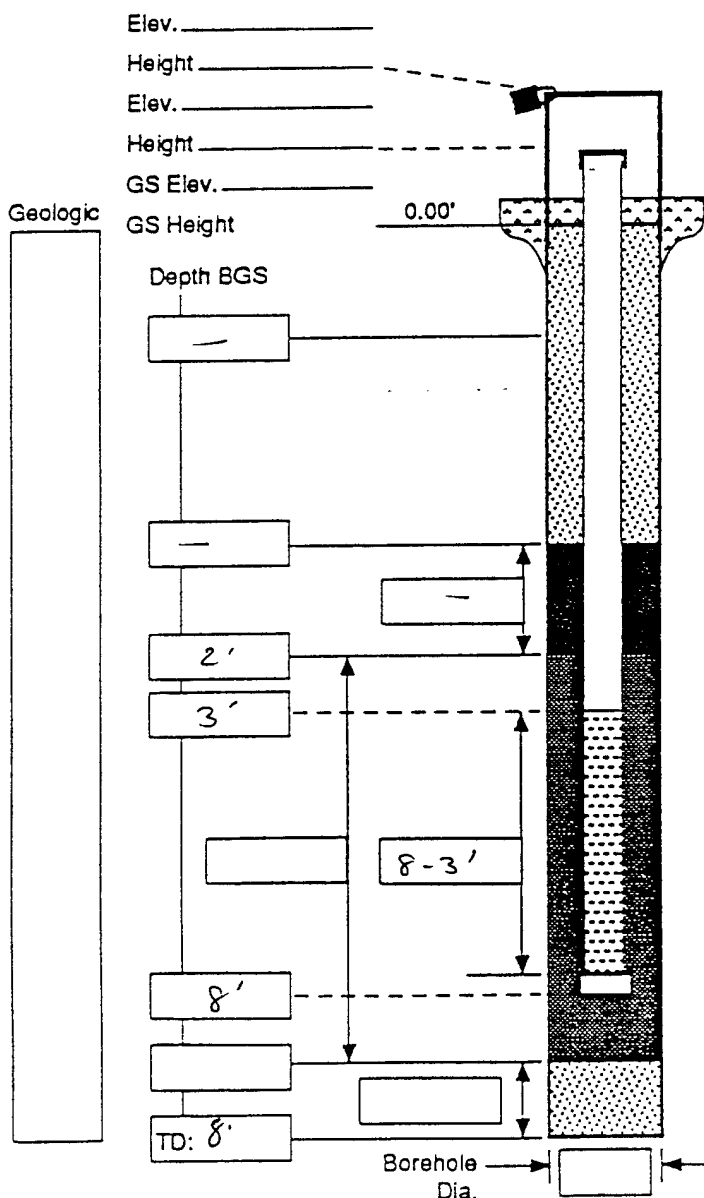


**Monitoring Well Construction Forms**



# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/21/93</u>
Well: <u>SIP21</u>	Well ID: <u>SIP21</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>8'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/23/93</u>	Depth to Water (ft): <u>~2</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/12/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB/megal</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSG

Material / Type: JSB  
 Diameter: 7/21/93  
 Depth BGS: 7/21/93 Weep Hole (Y/N)

## GUARD POSTS (Y/N)

No.: — Type: —

## SURFACE PAD

Composition and Size: —

## RISER PIPE

Type: Schedule 40 PVC  
 Diameter: 2"  
 Total Length (TOC to TOS): 3'-0"  
 Ventilated Cap (Y/N) —

## GROUT

Composition and Proportions: —

Tremied (Y/N) —

Interval BGS: —

## CENTRALIZERS

Depth(s): —

## SEAL

Type: —

Source: —

Setup / Hydration Time: — Vol. Fluid Added: —

Tremied (Y/N) —

## FILTER PACK

Type: Global #7

AmL Used: 3 bags (50#) each

Tremied (Y/N) — 8'-2' BGS

Source: Global Drilling Supplies

Gr. Size Dist: —

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010

Interval BGS: 8'-3'

## WELL FOOT (Y/N)

Interval BGS: — Length: —

Bottom Cap (Y/N) —

## BACKFILL PLUG

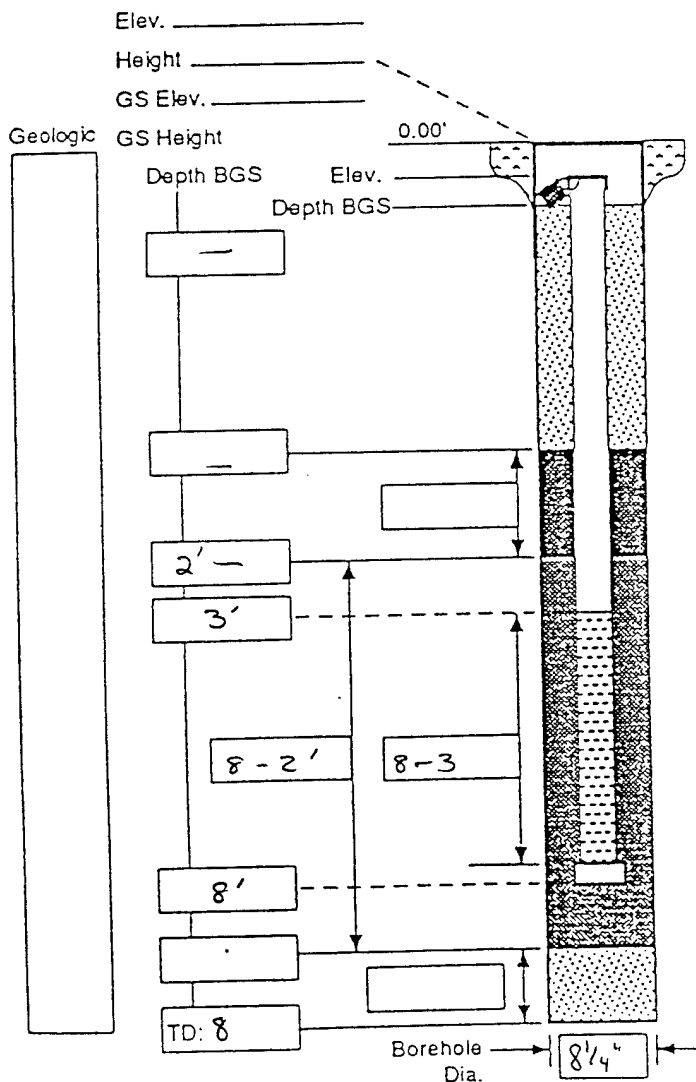
Material: JSB 9/21/93

Setup / Hydration Time: —

Tremied (Y/N) —

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/23/93</u>
Well: <u>SIPZ2</u>	Well ID: <u>PSIPZ2</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>8'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/23/93</u>	Depth to Water (ft): <u>—</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/12/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DP Payne</u>	Checked by: <u>J Smeyel</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSO

Material / Type: JSB  
 Diameter: 7/2" / 93  
 Depth BGS: 7/2" / 93 Weep Hole (Y/N)  
 GUARD POSTS (Y/N)  
 No.: — Type: —

## SURFACE PAD

Composition and Size: —

## RISER PIPE

Type: Schedule 40 PVC  
 Diameter: 2"  
 Total Length (TOC to TOS): 3'-0"  
 Ventilated Cap (Y/N)

## GROUT

Composition and Proportions: —

Tremied (Y/N)

Interval BGS: JSB 9/21/93

## CENTRALIZERS

Depth(s): —

## SEAL

Type: —

Source: —

Setup / Hydration Time: — Vol. Fluid Added: —

Tremied (Y/N)

## FILTER PACK

Type: Global Drilling Supplies

AML Used: 3 50 lb bags

Tremied (Y/N) 8'-2' BGS; Global #7

Source: —

Gr. Size Dist: —

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 8'-3'

## WELL FOOT (Y/N)

Interval BGS: — Length: —

Bottom Cap (Y/N)

## BACKFILL PLUG

Material: JSB 9/21/93

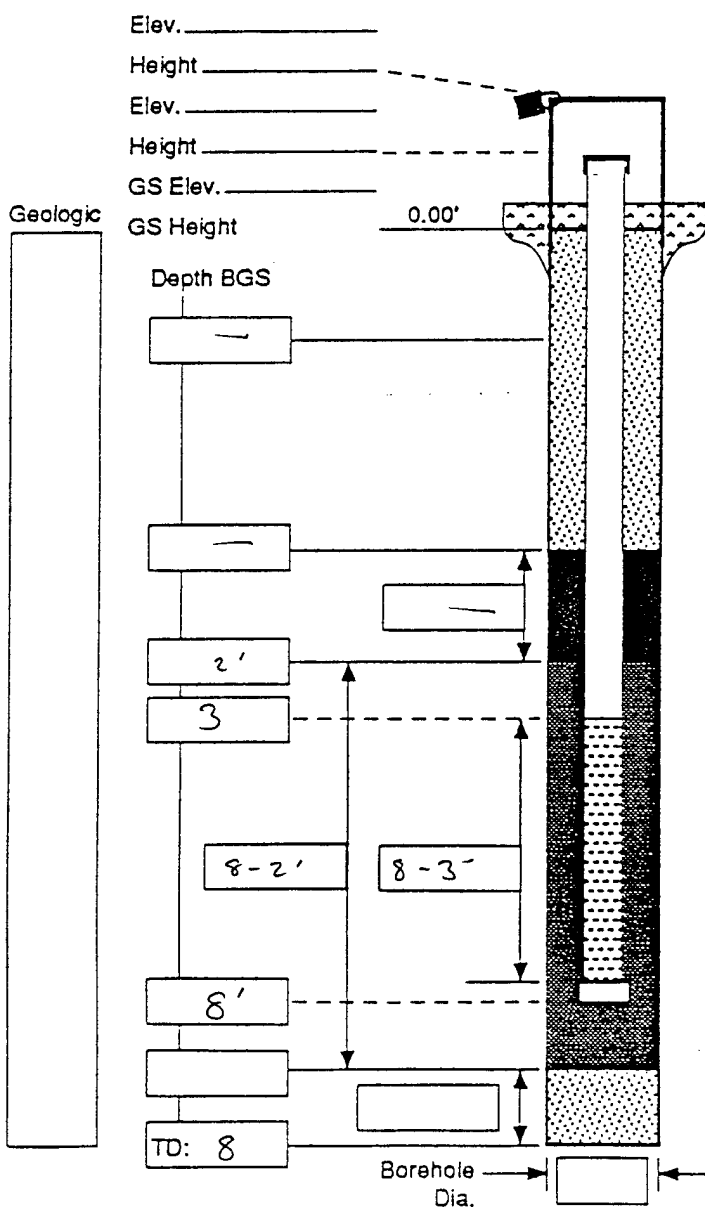
Setup / Hydration Time: —

Tremied (Y/N)

Form F-1025

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/21/93</u>
Well: <u>SIPZ3</u>	Well ID: <u>SIPZ3</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (In): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>8'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/23/93</u>	Depth to Water (ft): <u>~2'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/12/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB/meg</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>



**PROTECTIVE CSG**  
Material / Type: JSB  
Diameter: 2"  
Depth BGS: 9/21/93 Weep Hole (Y/N) -

**GUARD POSTS (Y/N)**  
No.: - Type: -

**SURFACE PAD**  
Composition and Size: -

**RISER PIPE**  
Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOC to TOS): 3' to ~0'  
Ventilated Cap (Y/N) -

**GROUT**  
Composition and Proportions: -

**Tremied (Y/N)** JSB  
Interval BGS: 9/21/93

**CENTRALIZERS**  
Depth(s): -

**SEAL**  
Type: -  
Source: -  
Setup / Hydration Time: - Vol. Fluid Added: -

**Tremied (Y/N)** JSB  
Interval BGS: 9/21/93

**FILTER PACK**  
Type: Global #7  
Amt. Used: 3-50# bags  
Tremied (Y/N) JSB  
Interval BGS: 8'-2' BGS  
Source: Global Drilling Supplies

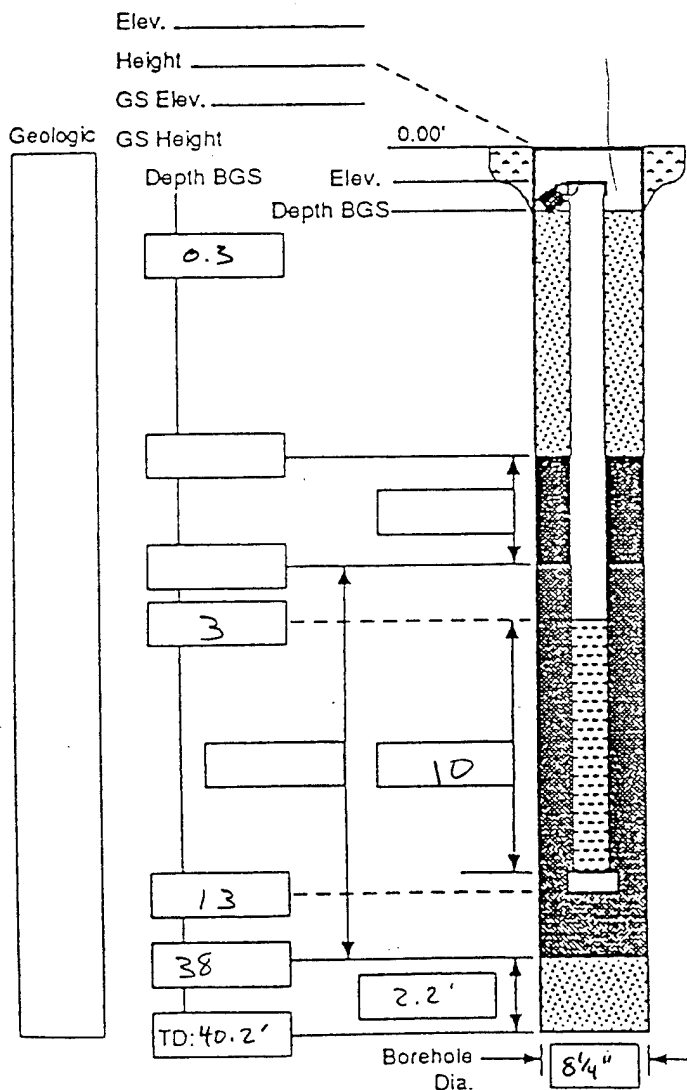
**Gr. Size Dist:**  
**SCREEN**  
Type: Schedule 40 PVC  
Diameter: 2"  
Slot Size and Type: 0.010"  
Interval BGS: 8'-3' BGS

**WELL FOOT (Y/N)** JSB  
Interval BGS: - Length: -

**Bottom Cap (Y/N)** JSB  
**BACKFILL PLUG**  
Material: JSB  
Setup / Hydration Time: 9/21/93  
Tremied (Y/N) JSB

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins Ave</u>	Project Number: <u>931800</u>	Date: <u>8/24/93</u>
Well: <u>SIMWI</u>	Well ID: <u>SIMWI</u>	Sheet: <u>1 of 1</u>
Driller: <u>D. Griffiths</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>40.5</u>
Drilling Agency: <u>Stearns Drilling</u>	Date Started: <u>8/24/93</u>	Depth to Water (ft): <u>3</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/24/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>hollow stem auger</u>	Logged by: <u>ME Stoker</u>	Checked by: <u>JS Bruegel</u>
Drilling Fluid: <u>none</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSO

Material / Type: N/A

Diameter: \_\_\_\_\_

Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

GUARD POSTS (Y/N) \_\_\_\_\_

No. \_\_\_\_\_

Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: Concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): ~ 3'

Ventilated Cap (Y/N) \_\_\_\_\_

## GROUT

Composition and Proportions: cement/bentonite mixture

Interval BGS: ~ 13 - 1'

Tremied (Y/N) \_\_\_\_\_

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: bentonite pellets

Source: Baroid

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: 5 gallons

Tremied (Y/N) \_\_\_\_\_

## FILTER PACK

Type: Global Drilling Supplies #7

AML Used: 7 - 50 lb bags

Tremied (Y/N) \_\_\_\_\_

Source: Global drilling supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: PVC Schedule 40

Diameter: 2"

Slot Size and Type: 0.010

Interval BGS: 3 - 13'

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) \_\_\_\_\_

## BACKFILL PLUG

Material: hole plug 40.5 - 38 ; collapse 38 - 20

Setup / Hydration Time: \_\_\_\_\_

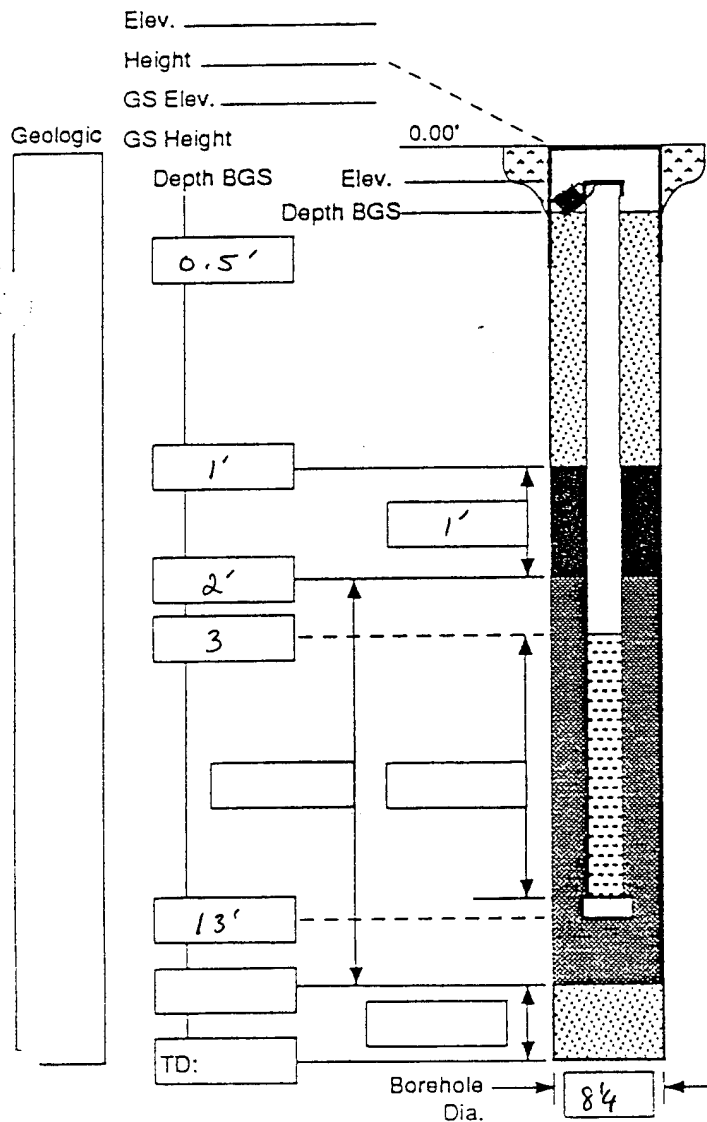
Tremied (Y/N) \_\_\_\_\_

hole plug 20 - 15'

Form F-1025

## Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/27/93</u>
Well: <u>SIMW2</u>	Well ID: <u>SIMW2</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/26/93</u>	Depth to Water (ft): <u>~3</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/27/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>MES</u>	Checked by: <u>J. Sniegel</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



### PROTECTIVE CSG

Material / Type: JSS 7/21/93  
 Diameter: —  
 Depth BGS: — Weep Hole (Y/N) —

### GUARD POSTS (Y/N)

No.: — Type: —

### SURFACE PAD

Composition and Size: concrete 2' x 2'

### RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): ~3'

Ventilated Cap (Y/N) (N)

### GROUT

Composition and Proportions: hole plug 1'-6"

Tremied (Y/N) (N)

Interval BGS: 1' - 0.5'

### CENTRALIZERS

Depth(s): N/A

### SEAL

Type: bentonite pellets 2'-1' BGS

Source: Baroid

Setup / Hydration Time: — Vol. Fluid Added: 5 gal

Tremied (Y/N) (N)

### FILTER PACK

Type: Global Drilling Supplies #7

Amt. Used: ~7-50 # bags

Tremied (Y/N) (N)

Source: Global Drilling

Gr. Size Dist: —

### SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 3-13'

### WELL FOOT (Y/N)

Interval BGS: — Length: —

Bottom Cap (Y/N) (Y)

### BACKFILL PLUG

Material: N/A

Setup / Hydration Time: —

Tremied (Y/N) (N)

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/27/93</u>
Well: <u>SIMW3</u>	Well ID: <u>SIMW3</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Gaffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13'</u>
Drilling Agency: <u>stearns</u>	Date Started: <u>8/27/93</u>	Depth to Water (ft): <u>~3'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/27/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DEJyne</u>	Checked by: <u>J S Bruer</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>

## PROTECTIVE CSO

Material / Type: JSB 9/21/93  
 Diameter: \_\_\_\_\_  
 Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

GUARD POSTS (Y/N) \_\_\_\_\_  
 No. \_\_\_\_\_ Type: \_\_\_\_\_

SURFACE PAD  
 Composition and Size: concrete 2' x 2'

RISER PIPE  
 Type: Schedule 40 PVC  
 Diameter: 2"

Total Length (TOC to TOS): 10' JSB 2/21/93 ~3'  
 Ventilated Cap (Y/N) \_\_\_\_\_

GROUT  
 Composition and Proportions: hole plug

Tremied (Y/N) \_\_\_\_\_  
 Interval BGS: ~1' - 0.5'

CENTRALIZERS  
 Depth(s): N/A

SEAL  
 Type: Hole plug - bentonite pellets 2'-1'  
 Source: Baroid

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: 5 gallons

Tremied (Y/N) \_\_\_\_\_  
 FILTER PACK

Type: Global Filter Pack #7  
 Amt. Used: 7-50 lb bags

Tremied (Y/N) \_\_\_\_\_  
 Source: Global Drilling Supplies

Gr. Size Dist: 13'-2' Bgs

SCREEN  
 Type: schedule 40 PVC

Diameter: 8" O.D. 2"  
 Slot Size and Type: 0.010"

Interval BGS: 13'-3'

WELL FOOT (Y/N) \_\_\_\_\_  
 Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

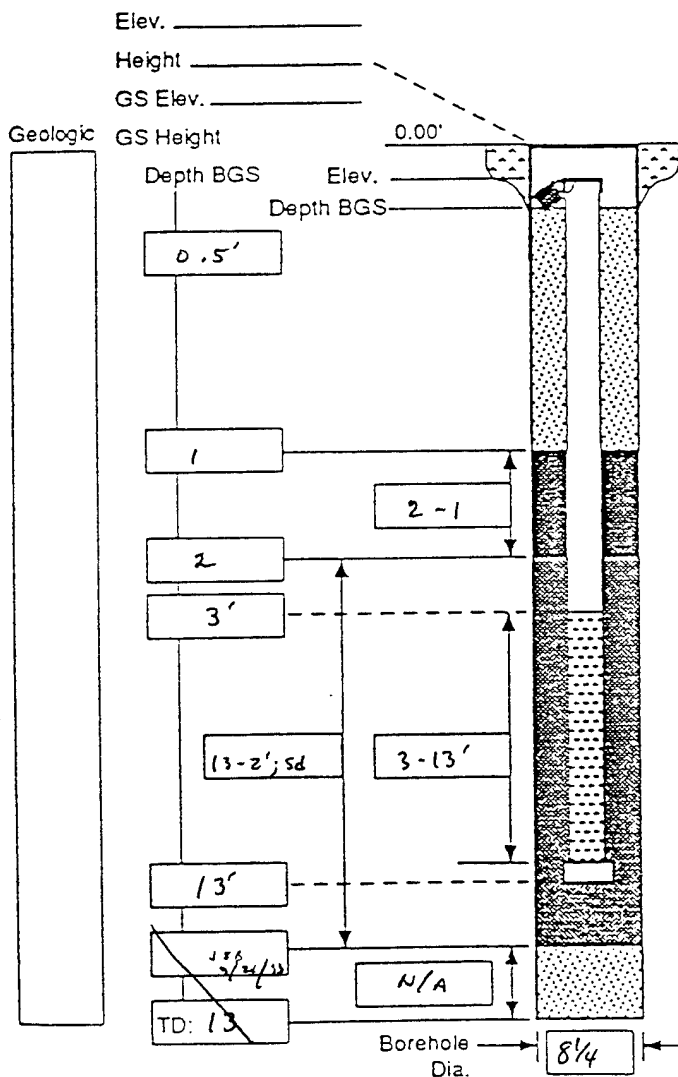
Bottom Cap (Y/N) \_\_\_\_\_  
 BACKFILL PLUG

Material: N/A

Setup / Hydration Time: \_\_\_\_\_

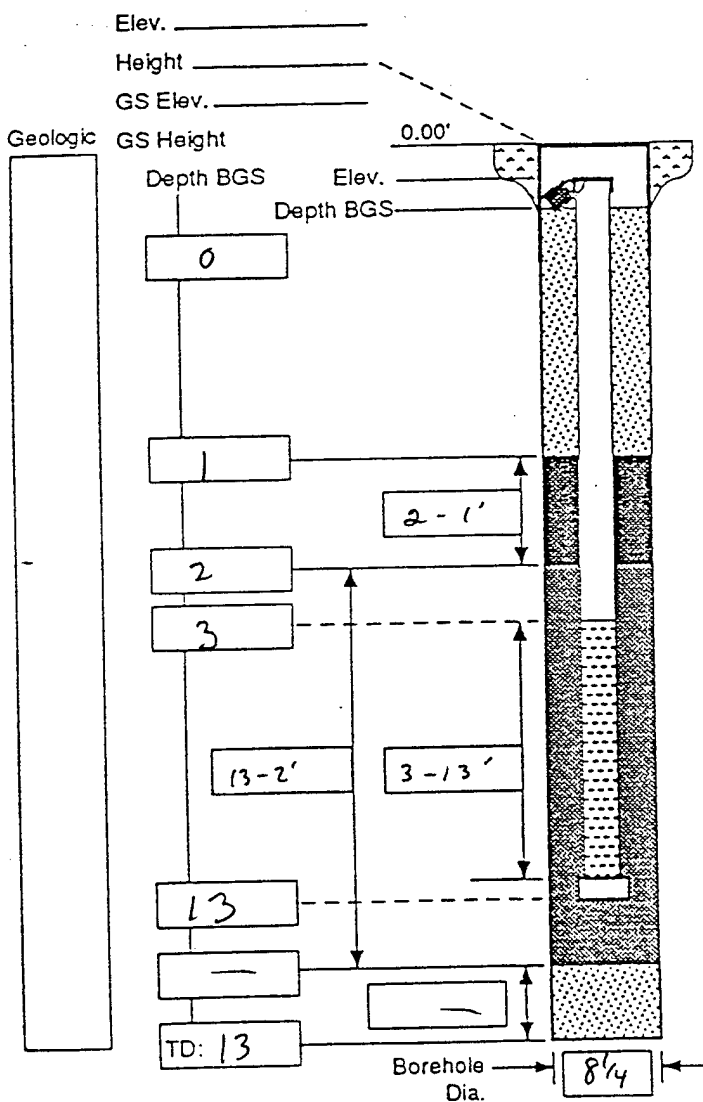
Tremied (Y/N) \_\_\_\_\_

Form F-1025



# Monitoring Well Construction Log - Flush Mount

Project Name: <b>Phelps Collins</b>	Project Number: <b>931800</b>	Date: <b>08/27/93</b>
Well: <b>.S1MW4</b>	Well ID: <b>91MW4</b>	Sheet: <b>1 of 1</b>
Driller: <b>D. Giffels</b>	Borehole Diameter (in): <b>8 1/4 OD</b>	Total Depth (ft): <b>13'</b>
Drilling Agency: <b>Stearns</b>	Date Started: <b>08/27/93</b>	Depth to Water (ft): <b>~3</b>
Drilling Equipment: <b>CME 750</b>	Date Finished: <b>08/27/93</b>	Elevation and Datum: <b>-</b>
Drilling Method: <b>HS</b>	Logged by: <b>M. Stoker</b>	Checked by: <b>JSB/meg</b>
Drilling Fluid: <b>None</b>	Number of Samples: <b>-</b>	Date: <b>-</b>



## PROTECTIVE CSG

Material / Type: **JSB 9/21/93**

Diameter: \_\_\_\_\_

Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

## GUARD POSTS (Y/N)

No.: \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: **concrete 2' x 2'**

## RISER PIPE

Type: **Schedule 40 PVC**

Diameter: **2"**

Total Length (TOC to TOS): **~3'**

Ventilated Cap (Y/N) \_\_\_\_\_

## GROUT

Composition and Proportions: **hole plug ~1'-0.5'**

Tremied (Y/N) **~1'-0.5'**

Interval BGS: \_\_\_\_\_

## CENTRALIZERS

Depth(s): **N/A**

## SEAL

Type: **benonite pellets ~2'-1'**

Source: **Baroid**

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added **5 gallons**

Tremied (Y/N) \_\_\_\_\_

## FILTER PACK

Type: **Global Drilling Supplies #7**

Am't Used: **7-50# bags**

Tremied (Y/N) **13-2'**

Source: **Global Drilling**

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: **Schedule 40 PVC**

Diameter: **2"**

Slot Size and Type: **0.010"**

Interval BGS: **3-13**

WELL FOOT (Y/N) \_\_\_\_\_

Interval BGS: \_\_\_\_\_ Length \_\_\_\_\_

Bottom Cap (Y/N) \_\_\_\_\_

## BACKFILL PLUG

Material: **JSB 9/21/93**

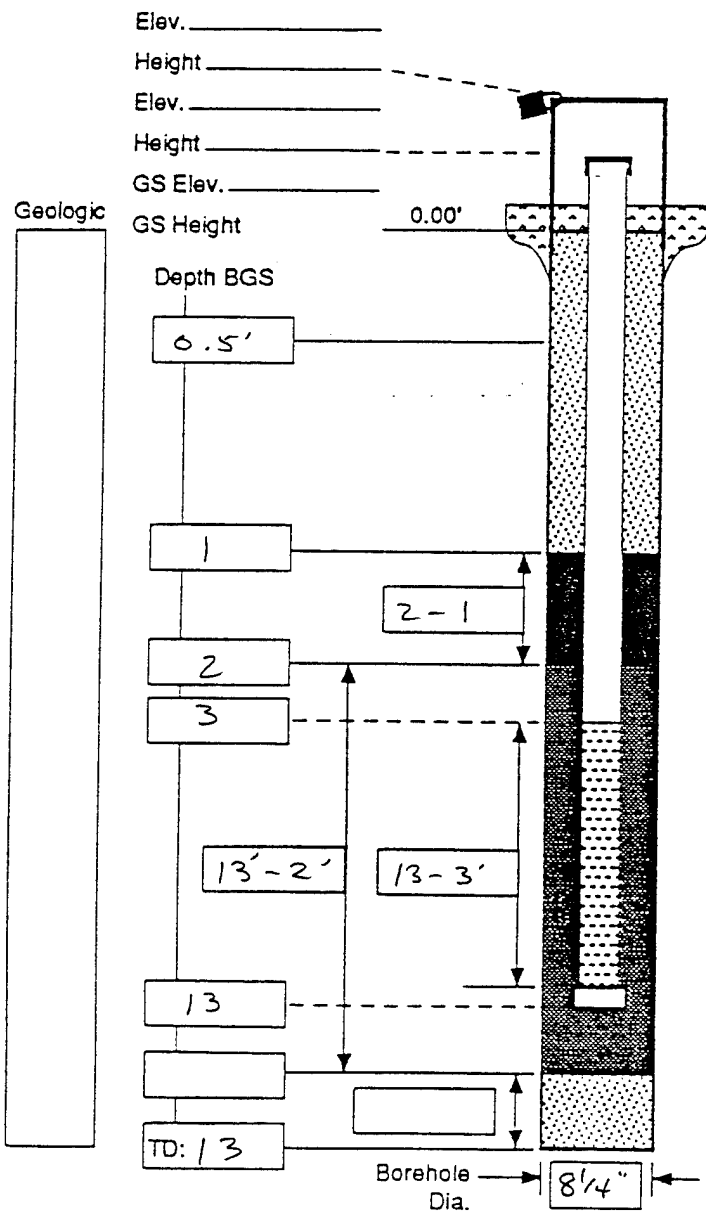
Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) \_\_\_\_\_

Form F-1025

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/28/93</u>
Well: <u>SIMW6</u>	Well ID: <u>SIMW6</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/28/93</u>	Depth to Water (ft): <u>~3</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/28/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB 9/21/93 JSBnegeal</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSG

Material / Type: Steel casing  
Diameter: 4"

Depth BGS: — Weep Hole (Y/N) —

## GUARD POSTS (Y/N)

No.: 3 Type: Cedar

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): 3' + 2' 5'

Ventilated Cap (Y/N) —

## GROUT

Composition and Proportions: hole plug 1' - 0.5'

Tremied (Y/N) —

Interval BGS: 1 - 0.5'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: bentonite pellets ~ 2' - 1'

Source: Baroid

Setup / Hydration Time: — Vol. Fluid Added 5 gallon

Tremied (Y/N) —

## FILTER PACK

Type: Global Drilling Supplies #7

Amt. Used: 7 - 50# bags

Tremied (Y/N) — 13 - 2'

Source: Global Drilling

Gr. Size Dist: —

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 3 - 13'

## WELL FOOT (Y/N)

Interval BGS: — Length: —

Bottom Cap (Y/N) —

## BACKFILL PLUG

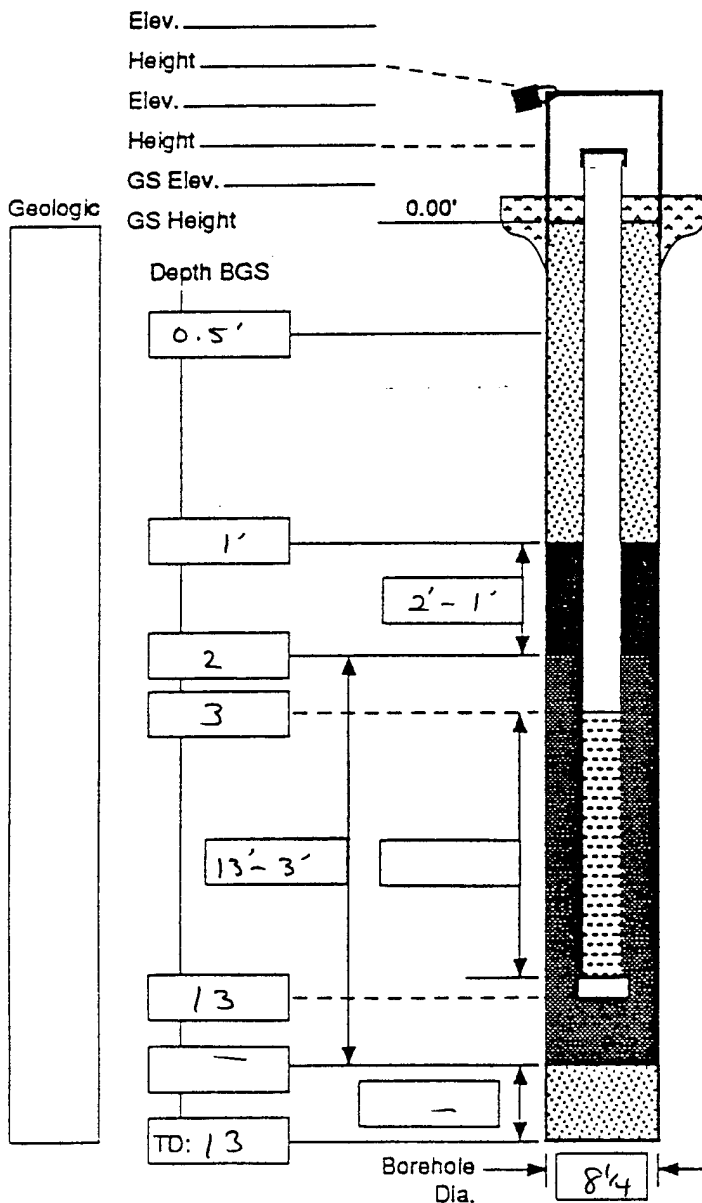
Material: JSB 9/21/93

Setup / Hydration Time: —

Tremied (Y/N) —

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/28/93</u>
Well: <u>SITW9 (SIMW9)</u>	Well ID: <u>SITW9</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft):
Drilling Agency: <u>Stearns</u>	Date Started:	Depth to Water (ft):
Drilling Equipment: <u>CME 750</u>	Date Finished:	Elevation and Datum:
Drilling Method: <u>Hollow stem Auger</u>	Logged by: <u>JSB</u>	Checked by: <u>PHC</u>
Drilling Fluid: <u>None</u>	Number of Samples:	Date: <u>9/22/93</u>



## PROTECTIVE CSG

Material / Type: JSB 9/21/93  
 Diameter: \_\_\_\_\_  
 Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_  
 GUARD POSTS (Y/N) \_\_\_\_\_  
 No.: \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: \_\_\_\_\_

## RISER PIPE

Type: Schedule 40 PVC  
 Diameter: 2"  
 Total Length (TOC to TOS): -3' to +2'  
 Ventilated Cap (Y/N) (Y) N

## GROUT

Composition and Proportions: none

## Tremied (Y/N)

Interval BGS: \_\_\_\_\_

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: hole plug - bentonite  
 Source: Baroid ~ 2'-1'  
 Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added 5 gal

## Tremied (Y/N)

## FILTER PACK

Type: Global Drilling #7 - 13'-2' BGS  
 Amt. Used: 7 - 50 # bags

## Tremied (Y/N)

Source: Global Drilling supplies

## Gr. Size Dist:

## SCREEN

Type: Schedule 40 PVC  
 Diameter: 2"  
 Slot Size and Type: 0.010  
 Interval BGS: 3 - 13'

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

## Bottom Cap (Y/N)

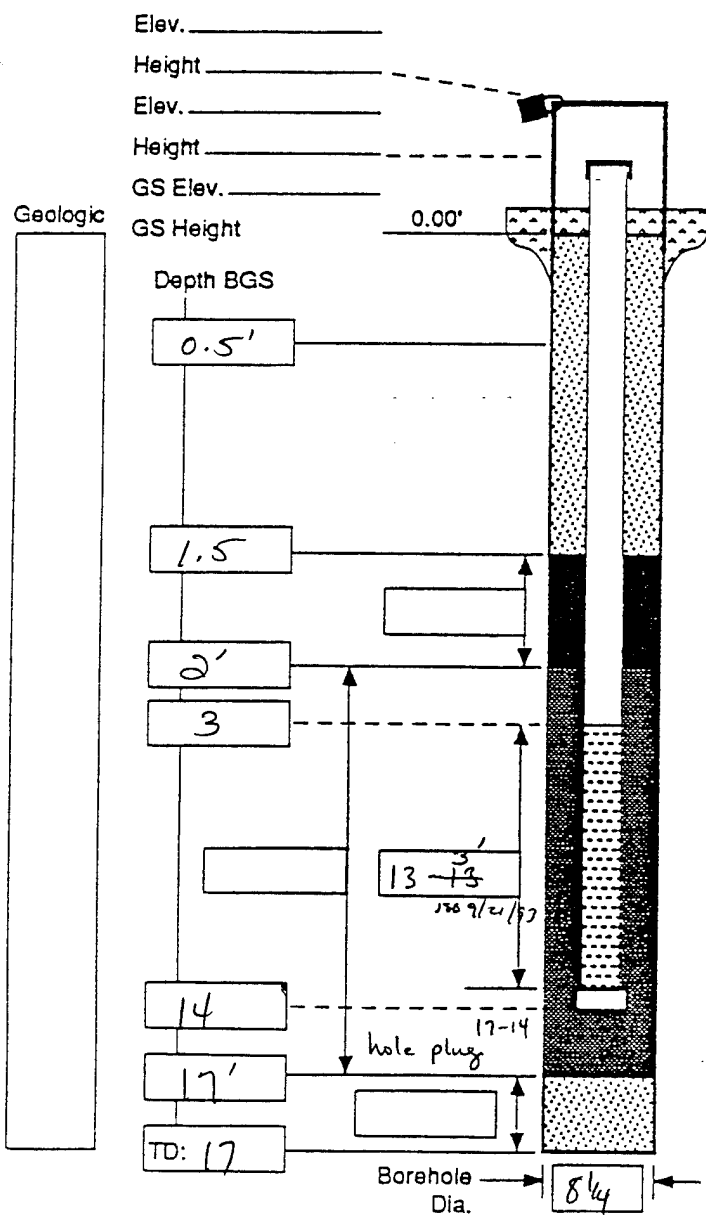
## BACKFILL PLUG

Material: JSB 9/21/93  
 Setup / Hydration Time: \_\_\_\_\_  
 Tremied (Y/N) \_\_\_\_\_

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>93/800</u>	Date: _____
Well: <u>SiMW10 (temporary well)</u>	Well ID: <u>SiMW10</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (In): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>17</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/29/93</u>	Depth to Water (ft): <u>~3'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/12/93</u>	Elevation and Datum: _____
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSBriegel</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: _____	Date: _____

pulled 9/12/93



**PROTECTIVE CSG**  
Material / Type: \_\_\_\_\_  
Diameter: \_\_\_\_\_  
Depth BGS: \_\_\_\_\_  
Weep Hole (Y/N) \_\_\_\_\_

**GUARD POSTS (Y/N)**  
No.: \_\_\_\_\_ Type: \_\_\_\_\_

**SURFACE PAD**  
Composition and Size: \_\_\_\_\_

**RISER PIPE**  
Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOC to TOS): -3' to +2' (~5')  
Ventilated Cap (Y/N) \_\_\_\_\_

**GROUT**  
Composition and Proportions: hole plug  
1.5 - 0.5'

Tremied (Y/N) \_\_\_\_\_  
Interval BGS: 1.5 - 0.5'

**CENTRALIZERS**  
N/A  
Depth(s): \_\_\_\_\_

**SEAL**  
Type: pellets - bentonite  
Source: Burroid  
Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added 5 gal

Tremied (Y/N) \_\_\_\_\_  
**FILTER PACK**  
Type: Global Drilling Supplies #7  
Amt. Used: 7 - 50 # bags  
Tremied (Y/N) \_\_\_\_\_  
Interval BGS: 2 - 14' BGS  
Source: Global #7

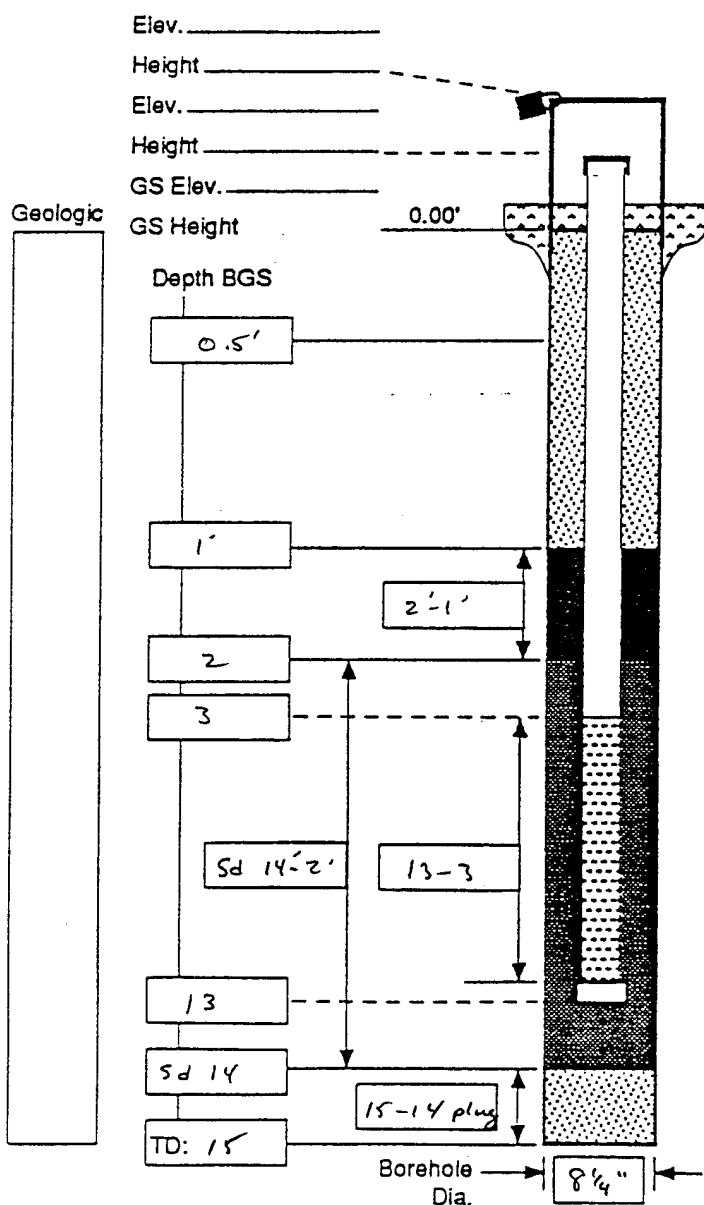
Gr. Size Dist: \_\_\_\_\_  
**SCREEN**  
Type: PVC Schedule 40  
Diameter: 2"  
Slot Size and Type: 0.010"  
Interval BGS: 3 - 13

**WELL FOOT (Y/N)**  
Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) \_\_\_\_\_  
**BACKFILL PLUG**  
Material: hole plug  
Setup / Hydration Time: 14 - 17  
Tremied (Y/N) through auger

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/29/93</u>
Well: <u>SIMW11</u>	Well ID: <u>SIMW11</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (In): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/29/93</u>	Depth to Water (ft): <u>~3</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/29/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSM</u>	Checked by: <u>PHL</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>



## PROTECTIVE CSG

Material / Type: Steel casing  
Diameter: 4"  
Depth BGS: -1 to +2.5' Weep Hole (Y/N) (N)  
GUARD POSTS (Y/N) (N)  
No.: - Type: -

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOC to TOS): -3' to +2' (5')  
Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: hole plug  
1' - 0.5'  
Tremied (Y/N) (N)  
Interval BGS: 1' - 0.5'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: Bentonite pellets  
Source: Baroid 2'-1'  
Setup / Hydration Time: - Vol. Fluid Added: 5 galls

## FILTER PACK

Type: Global #7  
Amt. Used: 7 - 50# bags  
Tremied (Y/N) (N) 9/2/93 2'-14' BGS  
Source: Global Drilling Supplies

## Gr. Size Dist:

## SCREEN

Type: Schedule 40 PVC  
Diameter: 2"  
Slot Size and Type: 0.010"  
Interval BGS: 3 - 13'

## WELL FOOT (Y/N)

Interval BGS: - Length: -

## Bottom Cap (Y/N)

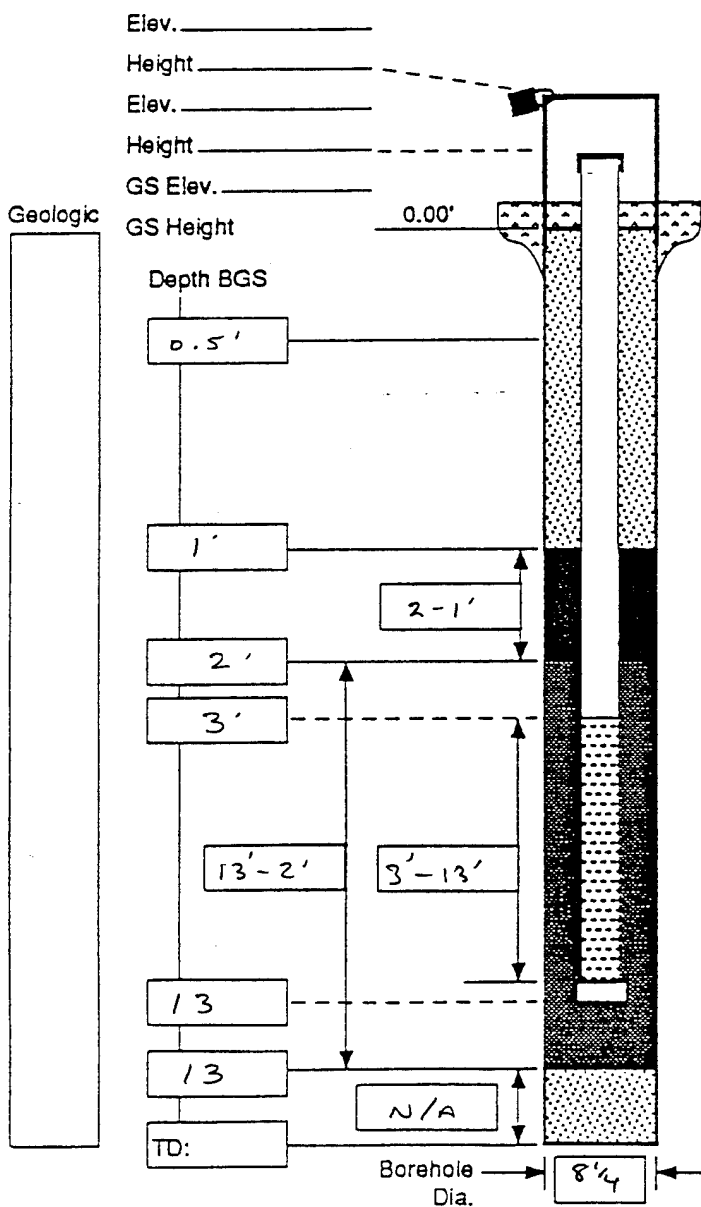
BACKFILL PLUG  
Material: JSS 9/2/93

Setup / Hydration Time: -  
Tremied (Y/N) (N)

Note: hole plug ± 15'-14' BGS

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/8/93</u>
Well: <u>SMW12</u>	Well ID: <u>SMW12</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Griffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>9/8/93</u>	Depth to Water (ft): <u>~3'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/8/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB</u>	Checked by: <u>Phly</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>9/22/93</u>



## PROTECTIVE CSQ

Material / Type: Steel Casing

Diameter: 4"

Depth BGS: +2' - -2' Weep Hole (Y/N) (N)

## GUARD POSTS (Y/N)

No. \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): -3 to +2'

Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: hole plug

1' - 0.5'

Tremied (Y/N) (N)

Interval BGS: 1' - 0.5'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type:  Bentonite pellets

Source: Baroid 2' - 1'

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added 5

Tremied (Y/N) (N) gallons

## FILTER PACK

Type: Global #7

Amt. Used: 6 - 50# bags

Tremied (Y/N) (N) 13 - 2

Source: Global Drilling Supplies

Gr. Size Dist:

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 3 - 13'

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) (N)

## BACKFILL PLUG

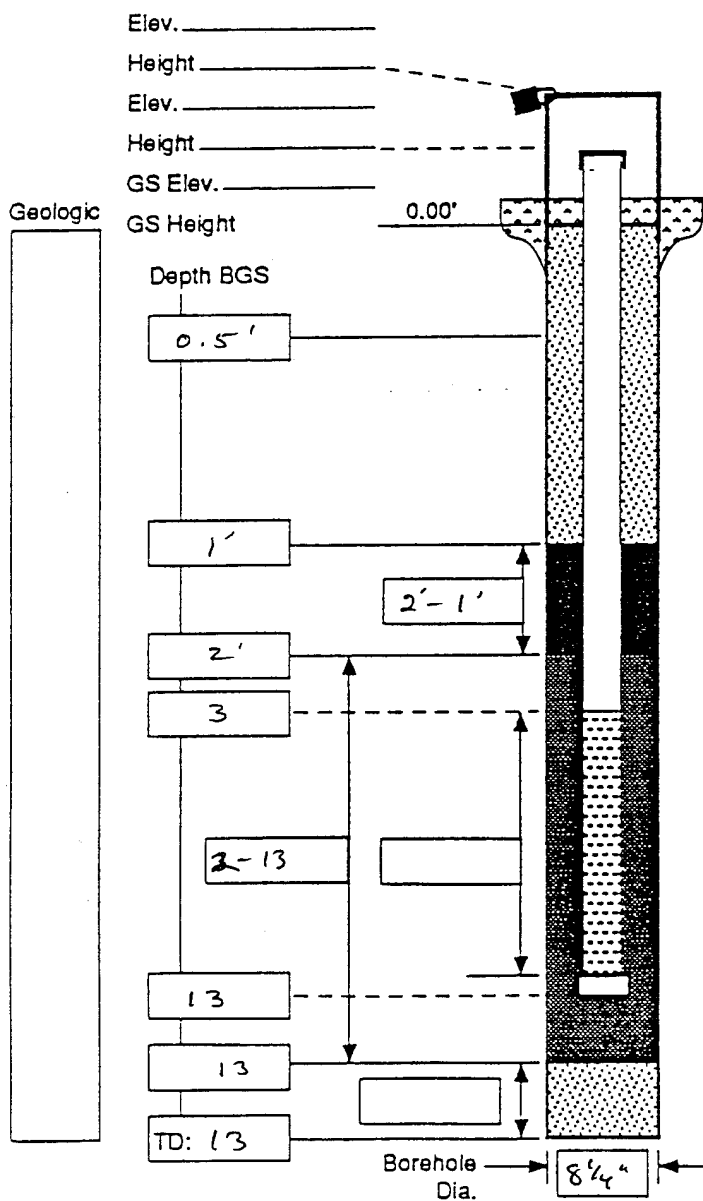
Material: JSB 9/21/93

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) \_\_\_\_\_

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/21/93</u>
Well: <u>SIMW13</u>	Well ID: <u>SIMW13</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>9/8/93</u>	Depth to Water (ft): <u>~3'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/10/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DRS/JSB</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSG

Material / Type: Steel Casing  
 Diameter: 4"  
 Depth BGS: +2' - -3' BGS Weep Hole (Y/N) (N)

## GUARD POSTS (Y/N)

No. — Type: —

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): +2' - -3' BGS

Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: hole plug 0.5-1'

Tremied (Y/N) (N) 0.5-1'

Interval BGS: —

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: bariumite pellets

Source: Baroid 2-1'

Setup / Hydration Time: — Vol. Fluid Added 5 gallon

Tremied (Y/N) (N)

## FILTER PACK

Type: Global Drilling #7

Amt. Used: 6 - 50# bags

Tremied (Y/N) (N)

Source: Global Drilling Supplies

Gr. Size Dist.: —

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 3-13

## WELL FOOT (Y/N)

Interval BGS: — Length: —

Bottom Cap (Y/N) (N)

## BACKFILL PLUG

Material: JSB 9/21/93

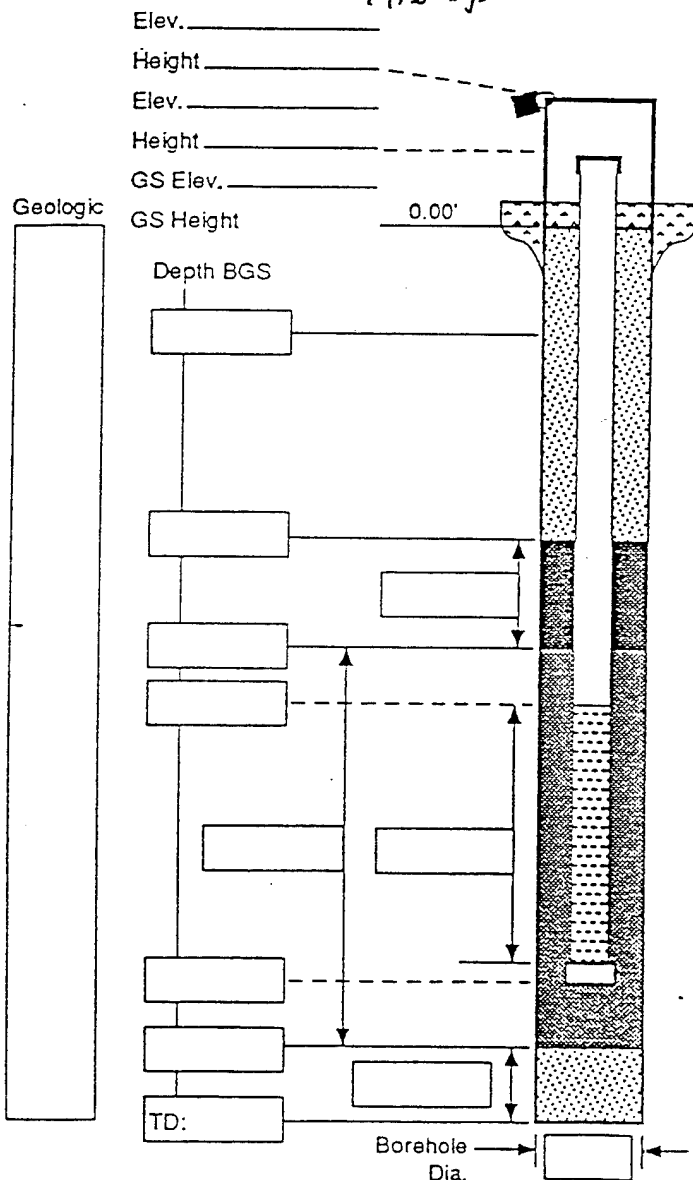
Setup / Hydration Time: —

Tremied (Y/N) (N)

# Monitoring Well Construction Log - Above Ground

Project Name: <b>Phelps Collins ANG</b>	Project Number: <b>95800</b>	Date: <b>9/11/93</b>
Well: <b>SIMW14</b>	Well ID: <b>SIMW14</b>	Sheet: <b>1</b> of <b>1</b>
Driller: <b>D. Giffels</b>	Borehole 14 1/4" O.D. to 14.0695 Diameter (in): <b>8 1/4" O.D. to 30'</b>	Total Depth (ft): <b>30'</b>
Drilling Agency: <b>Stearns</b>	Date Started: <b>9/10/93</b>	Depth to Water (ft): <b>~ 3</b>
Drilling Equipment: <b>CME 750</b>	Date Finished: <b>9/11/93</b>	Elevation and Datum:
Drilling Method: <b>Hollow Stem Auger</b>	Logged by: <b>DP Payne</b>	Checked by: <b>J S Smey</b>
Drilling Fluid: <b>None</b>	Number of Samples: <b>1</b>	Date: <b>-</b>

Note: set surface casing of 10 1/4" I.D. PVC from 1.5' above ground to 14.0' BGS.



borehole 0-14' BGS 10 1/4" I.D.  
surface casing

## PROTECTIVE CSG

Material / Type: **Steel Casing**

Diameter: **4"**

Depth BGS: **+2' - -2' BGS**

Weep Hole (Y/N) **(Y)**

## GUARD POSTS (Y/N)

No.: **3** Type: **Galvan**

## SURFACE PAD

Composition and Size: **2x2 Cement Pad**

## RISER PIPE

Type: **Schedule 40 PVC** <sup>DPJ</sup> ~~from 50'~~

Diameter: **2"**

Total Length (TOC to TOS): **10'**

Ventilated Cap (Y/N)

## GROUT

Composition and Proportions: **Cement (Type I) / bentonite 16 - 0.5' BGS**

Tremied (Y/N)

Interval BGS: **16 - 0.5'**

## CENTRALIZERS

Depth(s): **N/A**

## SEAL

Type: **Baroid Bentonite Seal - liquid \***

Source: **18 - 16' BGS**

Setup / Hydration Time:

Vol. Fluid Added:

Tremied (Y/N) **DPJ**

## FILTER PACK

Type: **Global Filter Pack #7**

Am't Used: **6 / 50 lb bags**

Tremied (Y/N) **30 - 18**

Source: **Global Drilling supplies**

Gr. Size Dist:

## SCREEN

Type: **Schedule 40 PVC**

Diameter: **2"**

Slot Size and Type: **0.010"**

Interval BGS: **30' - 20'**

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length:

Bottom Cap (Y/N)

## BACKFILL PLUG

Material: **JSG 9/21/93**

Setup / Hydration Time:

Tremied (Y/N)

Filter pack from 30' - 18.5' BGS

Form F-1024

\* Note: Drillers could not get pellets to sink even using tremie pipe + spotting on top of sand pack. They mixed a thick, liquid benton. seal.

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/16/93</u>
Well: _____	Well ID: <u>MP3MW6</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>42'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/16/93</u>	Depth to Water (ft): _____
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/16/93</u>	Elevation and Datum: _____
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DFJ</u>	Checked by: <u>PHCag</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>9/22/93</u>

## PROTECTIVE CSG

Material / Type: DFJ  
 Diameter: \_\_\_\_\_  
 Depth BGS: \_\_\_\_\_ Weep Hole (Y / N)  
 GUARD POSTS (Y / N) Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: concrete 2'x2'

## RISER PIPE

Type: Schedule 40 PVC  
 Diameter: 2"  
 Total Length (TOC to TOS): \_\_\_\_\_  
 Ventilated Cap (Y / N)

## GRGUT

Composition and Proportions: \_\_\_\_\_

## Tremied (Y / N)

Interval BGS: \_\_\_\_\_

## CENTRALIZERS

Depth(s): \_\_\_\_\_

## SEAL

Type: \_\_\_\_\_

Source: \_\_\_\_\_

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: \_\_\_\_\_

## Tremied (Y / N)

## FILTER PACK

Type: Global #7

Amt. Used: 7 / 50 lbs bags

Tremied (Y / N) \_\_\_\_\_

Source: Global Drilling Supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 12'-27'

## WELL FOOT (Y / N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y / N) \_\_\_\_\_

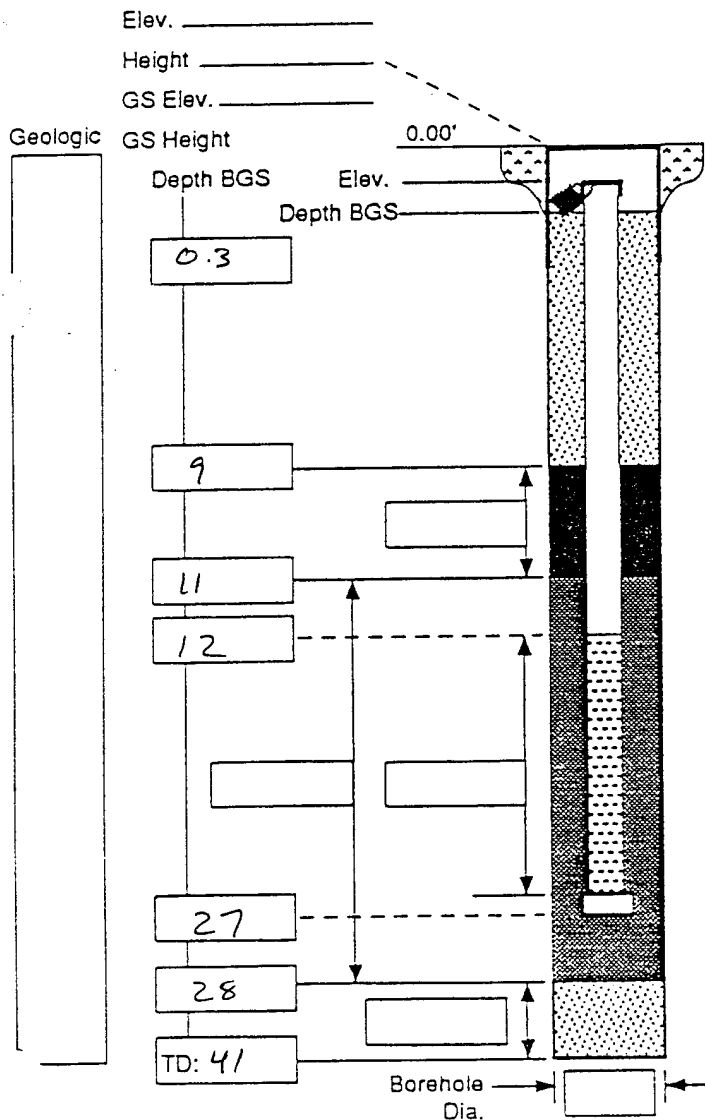
## BACKFILL PLUG

Material: Hole Plug 28'-27'

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y / N) \_\_\_\_\_

Form F-1023  
9/1/91



# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins AN6</u>	Project Number: <u>931800</u>	Date: <u>8/17/93</u>
Well	Well ID: <u>MP2 MW7</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>15</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/17/93</u>	Depth to Water (ft):
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/17/93</u>	Elevation and Datum: <u>PH/Lay</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DFJ</u>	Checked by:
Drilling Fluid: <u>None</u>	Number of Samples:	Date:

## PROTECTIVE CSG

Material / Type: DFJ  
Diameter: 2"  
Depth BGS: 7/22/93 Weep Hole (Y / N)  
GUARD POSTS (Y / N) Type:

## SURFACE PAD

Composition and Size: Concrete 2' x 2'

## RISER PIPE

Type: schedule 40 PVC  
Diameter: 2"  
Total Length (TOG to TOS): 5'  
Ventilated Cap (Y / N)

## GROUT

Composition and Proportions: Grout / cement - bentonite mixture

Tremied (Y / N)

Interval BGS:

## CENTRALIZERS

Depth(s): DFJ 7/21/93

## SEAL

Type: DFJ  
Source: 8/21/93  
Setup / Hydration Time: Vol. Fluid Added

Tremied (Y / N)

## FILTER PACK

Type: Global #7  
Amt. Used: 7 - 50 lb bags  
Tremied (Y / N)  
Source: Global Drilling Supplies

Gr. Size Dist:

## SCREEN

Type: schedule 40 PVC  
Diameter: 2"  
Slot Size and Type: 0.010"  
Interval BGS: 5' - 15' BGS

## WELL FOOT (Y / N)

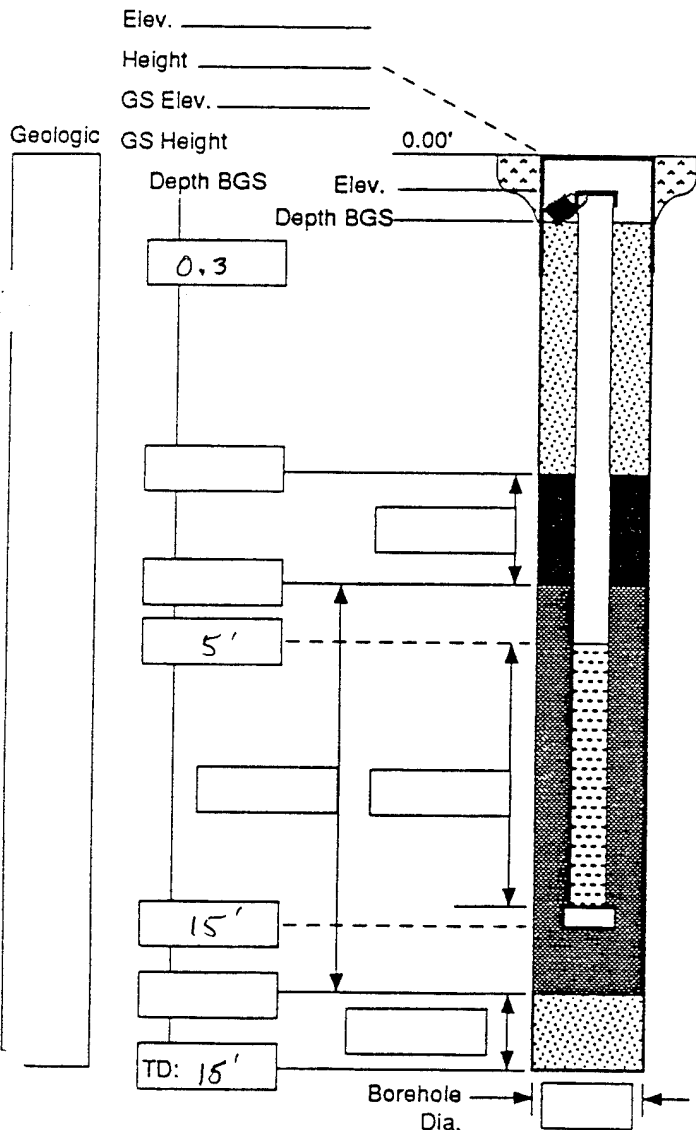
Interval BGS: Length

Bottom Cap (Y / N)

## BACKFILL PLUG

Material: DFJ  
Setup / Hydration Time:  
Tremied (Y / N)

Form F-1023  
9/1/91



# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/25/93</u>
Well: <u>CG3 MW6</u>	Well ID: <u>CG3 MW6</u>	Sheet <u>   </u> of <u>   </u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4"</u>	Total Depth (ft): <u>   </u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/25/93</u>	Depth to Water (ft): <u>-15</u>
Drilling Equipment: <u>CMG 750</u>	Date Finished: <u>8/30/93</u>	Elevation and Datum: <u>   </u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB</u>	Checked by: <u>PHL</u>
Drilling Fluid: <u>none</u>	Number of Samples: <u>   </u>	Date: <u>9/22/93</u>

## PROTECTIVE CSG

Material / Type: JSB 8/25/93  
Diameter:      
Depth BGS:     Weep Hole (Y/N)      
GUARD POSTS (Y/N)      
No.:     Type:    

## SURFACE PAD

Composition and Size:      
RISER PIPE Schedule 40 PVC  
Type:      
Diameter: 2"  
Total Length (TOC to TOS): 23-0'  
Ventilated Cap (Y/N) (Y) N  
GROUT      
Composition and Proportions:    

Tremied (Y/N)      
Interval BGS:    

CENTRALIZERS none  
Depth(s):    

SEAL      
Type:    

Source:     Vol. Fluid Added:      
Setup / Hydration Time:    

Tremied (Y/N)      
FILTER PACK Global Drilling Supplies #7

Type:      
Amt. Used:    

Tremied (Y/N) (Y) N Global Drilling Supplies #7  
Source:    

Gr. Size Disl:      
SCREEN Schedule 40 PVC

Type:      
Diameter: 2"

Slot Size and Type: 0.010  
Interval BGS: 23-23

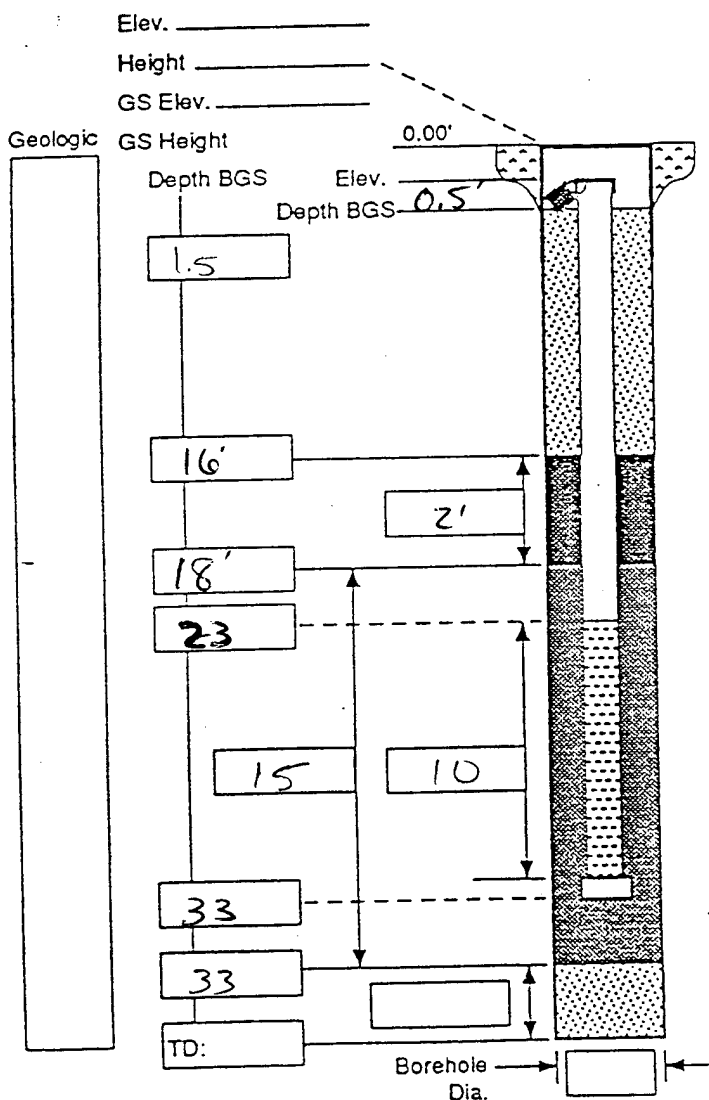
WELL FOOT (Y/N) (Y) N  
Interval BGS:     Length:    

Bottom Cap (Y/N) (Y) N  
BACKFILL PLUG    

Material: none  
Setup / Hydration Time:    

Tremied (Y/N)    

Form F-1025



# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/30/93</u>
Well	Well ID: <u>CG3mw7</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (In): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>35'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/30/93</u>	Depth to Water (ft): <u>14'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/31/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>PHL</u>	Checked by: <u>JSR</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>0</u>	Date: <u>9/22/93</u>

## PROTECTIVE CSO

Material / Type: N/A

Diameter: N/A

Depth BGS: \_\_\_\_\_ Weep Hole (Y / N)

## GUARD POSTS (Y / N)

No.: \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: 2'x2' concrete pad

## RISER PIPE

Type: PVC Sched 40

Diameter: 2" ID

Total Length (TOC to TOS): 0.3' to 12'

Ventilated Cap ☒ Y ☐ N

## GROUT

Composition and Proportions: \_\_\_\_\_

Tremied (Y / N) ☒ Y ☐ N

Interval BGS: 0.3 to 8'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: Bentonite pellets

Source: Global Drilling Supplies

Setup / Hydration Time: 30 minutes Vol. Fluid Added: Scal

Tremied (Y / N) ☐ Y ☒ N

## FILTER PACK

Type: Global #7 silica sand

Amt. Used: 5 - 50# Bags

Tremied (Y / N) ☒ Y ☐ N

Source: Global Drilling Supplier

Gr. Size Dist: #7

## SCREEN

Type: PVC Schedule 40

Diameter: 2" ID

Slot Size and Type: 0.010"

Interval BGS: 12-22'

## WELL FOOT (Y / N)

Interval BGS: N/A Length: \_\_\_\_\_

Bottom Cap (Y / N)

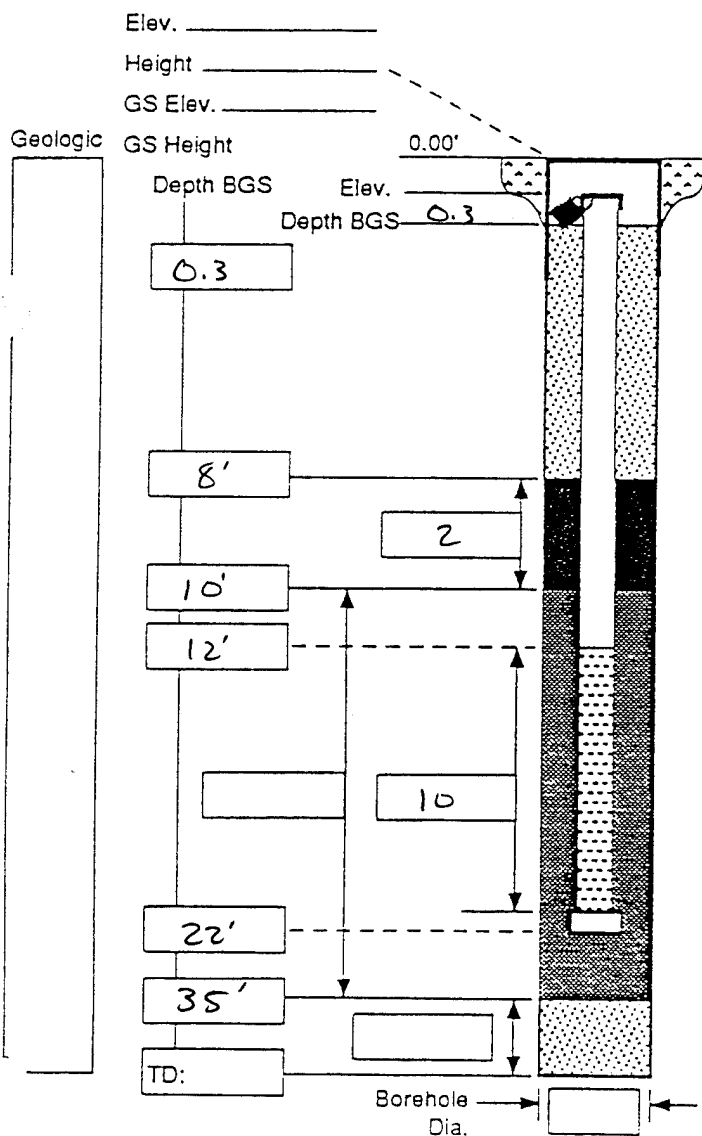
## BACKFILL PLUG

Material: cuttings / hole plug

Setup / Hydration Time: 30 minutes

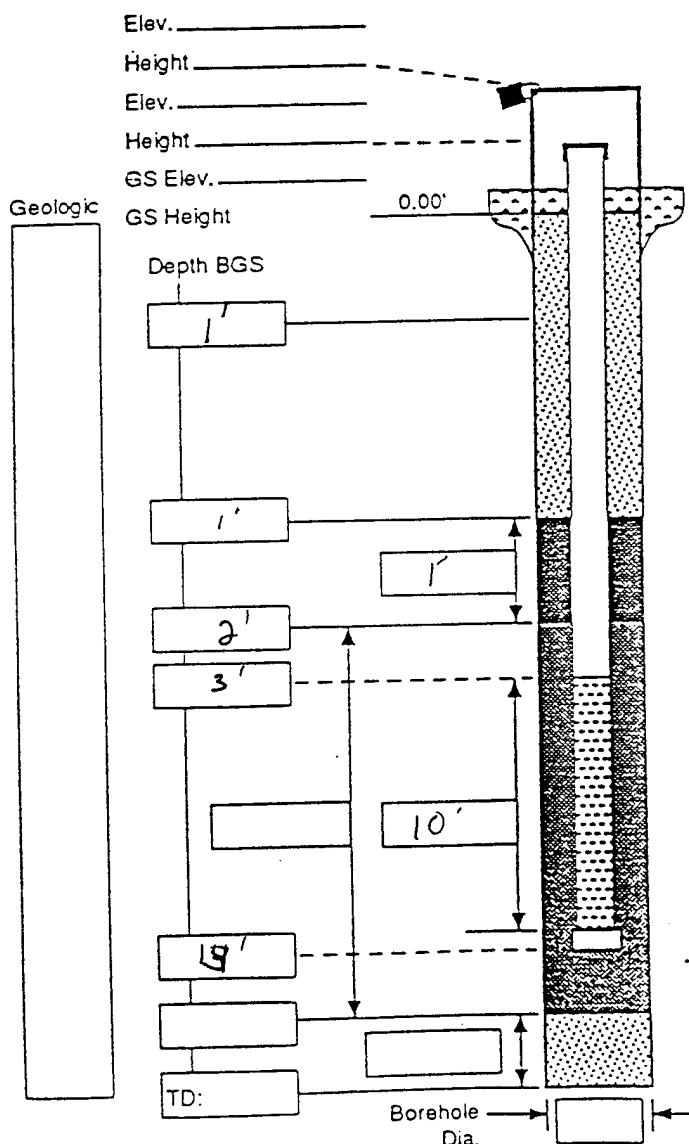
Tremied (Y / N)

Form F-1023  
9/1/91



# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins AN6</u>	Project Number: <u>931800</u>	Date: <u>8/12/93</u>
Well:	Well ID: <u>SF5 MW5</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>4 1/4"</u>	Total Depth (ft):
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/12/93</u>	Depth to Water (ft):
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/12/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DF Sample</u>	Checked by: <u>SSD</u>
Drilling Fluid: <u>None</u>	Number of Samples:	Date: <u>9/22/93</u>



## PROTECTIVE CSG

Material / Type: 4"  
Diameter: 2"  
Depth BGS: 2' Weep Hole ☒ (N)  
GUARD POSTS ☒ (N)  
No.: 4 Type: Steel

## SURFACE PAD

Composition and Size: Concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 2" PVC  
Diameter: 2"  
Total Length (TOC to TOS): 10'  
Ventilated Cap ☒ (N) J plug installed

## GROUT

Composition and Proportions: hole plug - DES  
Bentonite pellets

Tremied (Y / N)

Interval BGS:

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: Bentonite Pellets 8 - Grostone

Source:

Setup / Hydration Time: Vol. Fluid Added 1 gallon

Tremied (Y / N)

## FILTER PACK

Type: Global Drilling Supplies

AML Used: 8 50lb bags

Tremied (Y / N)

Source:

Gr. Size Dist:

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 3' - 14'

## WELL FOOT (Y / N)

Interval BGS: Length

Bottom Cap ☒ (N)

## BACKFILL PLUG

Material:

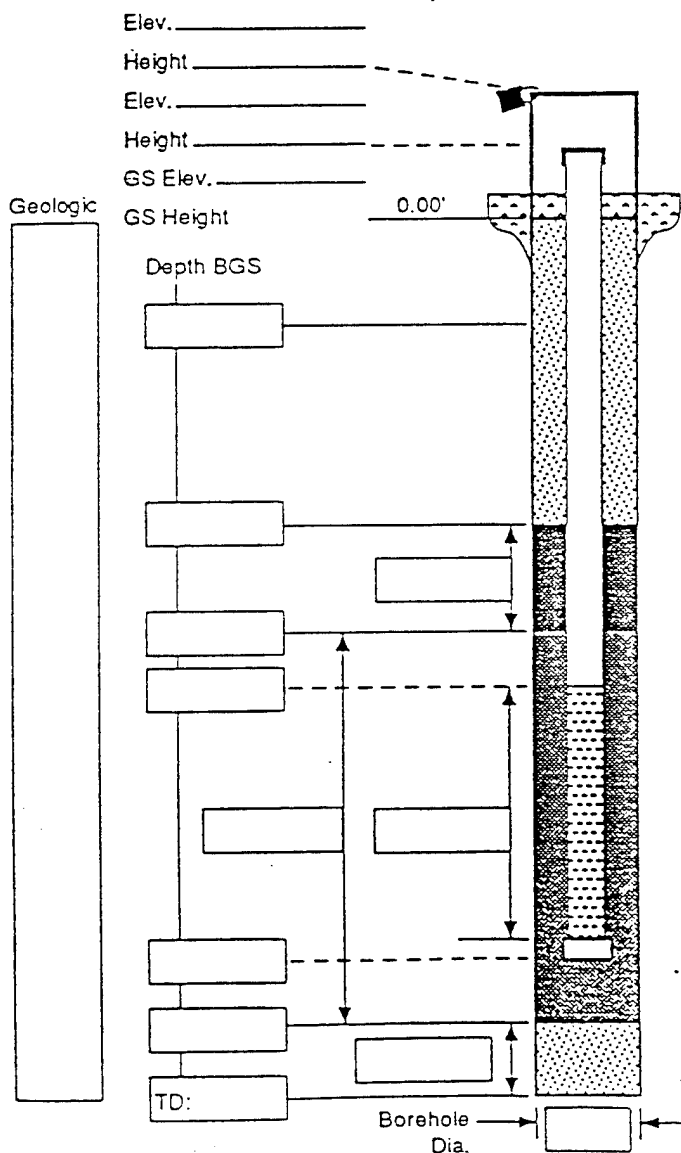
Setup / Hydration Time

Tremied (Y / N)

Form F-1024

# Monitoring Well Construction Log - Above Ground

Project Name: <b>Phelps Collins ANG</b>	Project Number: <b>931800</b>	Date: <b>8/12/93</b>
Well:	Well ID: <b>SF5 MW 6</b>	Sheet: <b>1</b> of <b>1</b>
Driller: <b>DFJ Stearns D. Giffels</b>	Borehole Diameter (in):	Total Depth (m): <b>21'</b>
Drilling Agency: <b>Stearns</b>	Date Started: <b>8/12/93</b>	Depth to Water (m): <b>± 5'</b>
Drilling Equipment: <b>CME 750</b>	Date Finished: <b>8/12/93</b>	Elevation and Datum:
Drilling Method: <b>Hollow Stem Auger</b>	Logged by: <b>DF Jayne</b>	Checked by:
Drilling Fluid: <b>None</b>	Number of Samples:	Date:



**PROTECTIVE CSG**  
Material / Type: \_\_\_\_\_  
Diameter: \_\_\_\_\_  
Depth BGS: \_\_\_\_\_ Weep Hole (Y / N) \_\_\_\_\_

**GUARD POSTS (Y / N)**  
No. \_\_\_\_\_ Type: \_\_\_\_\_

**SURFACE PAD**  
Composition and Size: \_\_\_\_\_

**RISER PIPE**  
Type: **schedule 40 2" PVC**  
Diameter: **2**  
Total Length (TOC to TOS): \_\_\_\_\_  
Ventilated Cap (Y / N) \_\_\_\_\_

**GROUT**  
Composition and Proportions: \_\_\_\_\_

Tremied (Y / N) \_\_\_\_\_  
Interval BGS: \_\_\_\_\_

**CENTRALIZERS**  
Depth(s): **None**

**SEAL**  
Type: **Bentonite Pellets**  
Source: \_\_\_\_\_  
Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: \_\_\_\_\_

Tremied (Y / N) \_\_\_\_\_  
**FILTER PACK**  
Type: **Global Drilling Supplies**  
Amt. Used: **9 50/lb bags**

Tremied (Y / N) \_\_\_\_\_  
Source: \_\_\_\_\_

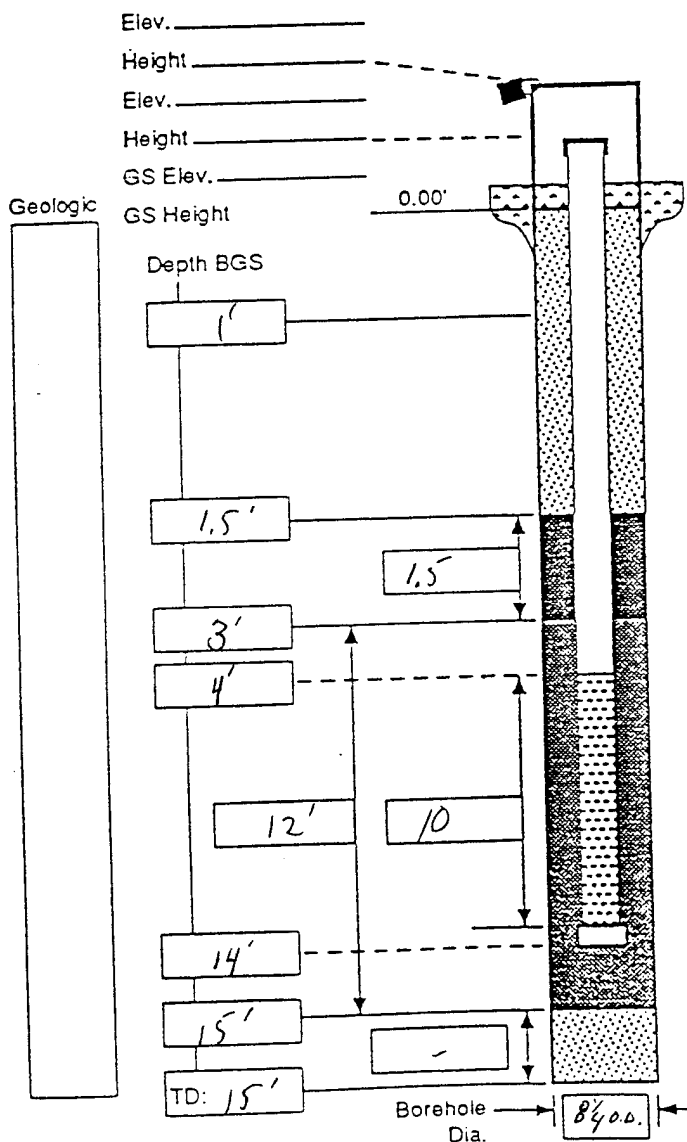
Gr. Size Dist: \_\_\_\_\_  
**SCREEN**  
Type: **schedule 40 PVC**  
Diameter: **2"**  
Slot Size and Type: **0.010"**

Interval BGS: \_\_\_\_\_  
**WELL FOOT (Y / N)**  
Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

**Bottom Cap (Y / N)**  
**BACKFILL PLUG**  
Material: \_\_\_\_\_  
Setup / Hydration Time: \_\_\_\_\_  
Tremied (Y / N) \_\_\_\_\_

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/12/93</u>
Well: _____	Well ID: <u>SFS-MW-7</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>7 1/4" p.d.</u>	Total Depth (ft): <u>15</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/12/93</u>	Depth to Water (ft): _____
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/12/93</u>	Elevation and Datum: _____
Drilling Method: <u>Hollow stem Auger</u>	Logged by: <u>JSBriegel</u>	Checked by: <u>DEF</u>
Drilling Fluid: <u>None</u>	Number of Samples: _____	Date: <u>9/22/93</u>



PROTECTIVE CSG  
Material / Type: \_\_\_\_\_  
Diameter: 4"  
Depth BGS: 2' Weep Hole (Y/N) \_\_\_\_\_

GUARD POSTS (BIN)  
No. 4 Type: Steel

SURFACE PAD  
Composition and Size: Concrete 2'x2'

RISER PIPE  
Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOC to TOS): 10'  
Ventilated Cap (Y/N) \_\_\_\_\_

GROUT  
Composition and Proportions: Cement/bentonite

Tremied (Y/N) \_\_\_\_\_  
Interval BGS: \_\_\_\_\_

CENTRALIZERS  
Depth(s): None

SEAL DIS  
Type: Bentonite Holeplug 2'-15' (2 50lb bags)

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: \_\_\_\_\_

Tremied (Y/N) \_\_\_\_\_  
FILTER PACK  
Type: Global Drilling Supplies #7

AmL Used: 7 50lb bags

Tremied (Y/N) \_\_\_\_\_  
Source: 15'-3'

Gr. Size Dist.: \_\_\_\_\_  
SCREEN  
Type: Schedule 40 PVC

Diameter: 2"  
Slot Size and Type: 0.010"

Interval BGS: 14'-4'  
WELL FOOT (Y/N) \_\_\_\_\_

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_  
Bottom Cap (Y/N) \_\_\_\_\_

BACKFILL PLUG DEF  
Material: \_\_\_\_\_  
Setup / Hydration Time: 9/22/93

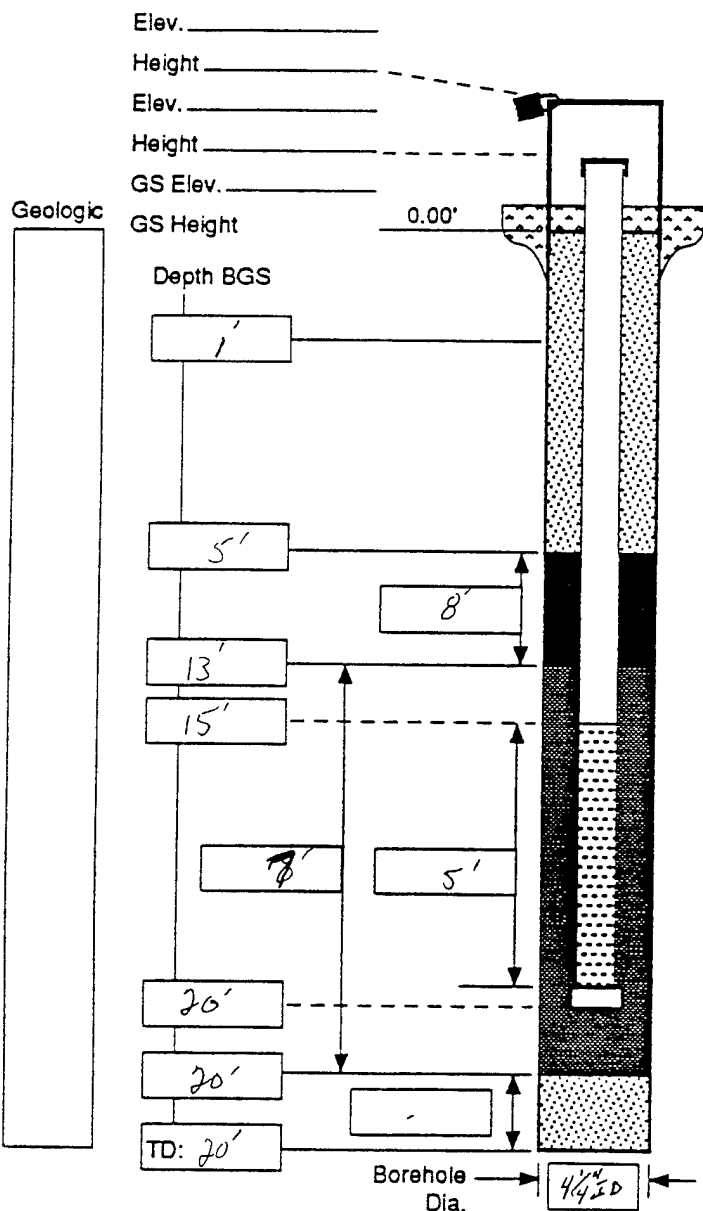
Tremied (Y/N) \_\_\_\_\_

Form F-1024

3'-1 1/2' Bentonite pellets

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/31/93</u>
Well	Well ID: <u>DEF</u> <u>LFGMW 8 SFSMW 8</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. G. ffels</u>	Borehole Diameter (in): <u>8 1/4" O.P.</u>	Total Depth (ft): <u>20'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/31/93</u>	Depth to Water (ft):
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/31/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JS Brige</u>	Checked by: <u>DKJ</u>
Drilling Fluid: <u>None</u>	Number of Samples:	Date: <u>9/22/93</u>



## PROTECTIVE CSG

Material / Type: 4"  
 Diameter: 4"  
 Depth BGS: 2' Weep Hole (Y/N) (Y)  
 GUARD POSTS (Y/N) (Y)  
 No.: 4 Type: Steel

## SURFACE PAD

Composition and Size: Concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC  
 Diameter: 2"  
 Total Length (TOG to TOS): 17'  
 Ventilated Cap (Y/N) (Y)

## GROUT

Composition and Proportions: Bentonite

## Tremied (Y/N)

Interval BGS: 0-5'

## CENTRALIZERS

Depth(s):

## SEAL

Type: Bentonite pellets

Source:

Setup / Hydration Time: Vol. Fluid Added:

## Tremied (Y/N)

## FILTER PACK

Type: Global #7

Amt. Used: 3/50lb bags

Tremied (Y/N) (Y)

Source: Global Drilling Supplies

## Gr. Size Dist:

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.075"

Interval BGS: 15'-20' BGS

## WELL FOOT (Y/N)

Interval BGS: Length:

## Bottom Cap (Y/N)

## BACKFILL PLUG

Material:

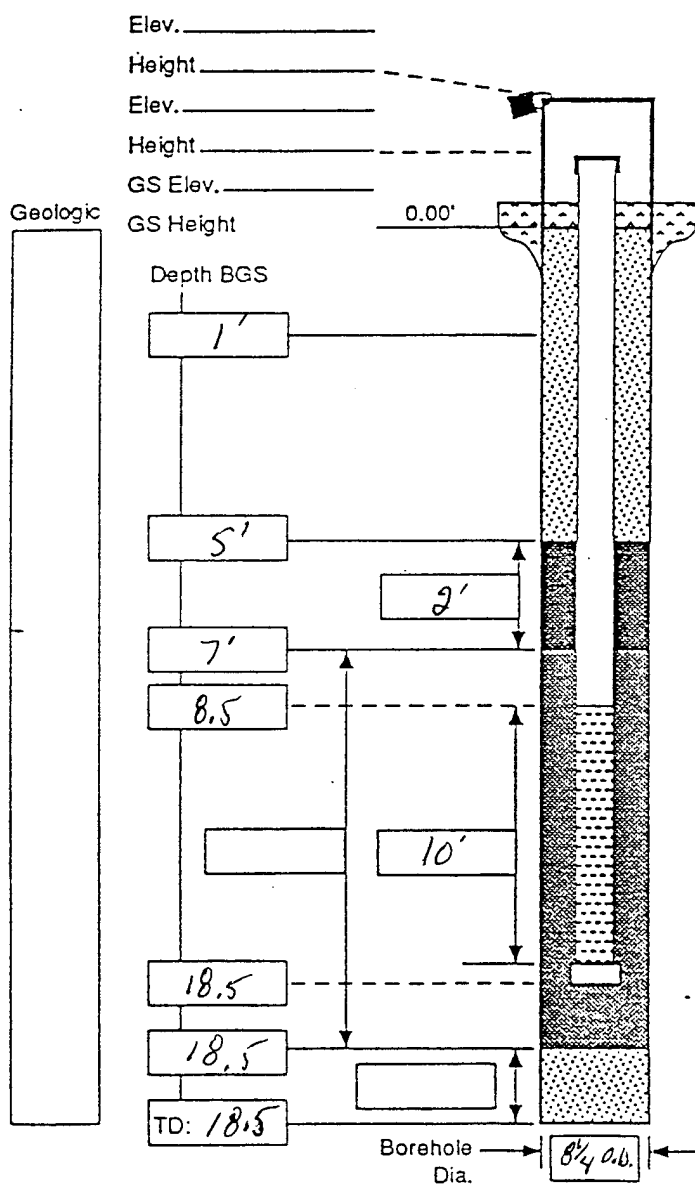
Setup / Hydration Time:

Tremied (Y/N) (Y)

9/22/93

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/10/93</u>
Well: <u>SF5MW9 (SF5TW9)</u>	Well ID: <u>SF5MW9</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4</u>	Total Depth (ft): <u>18.5</u>
Drilling Agency: <u>Stearns Drilling</u>	Date Started: <u>9/9/93</u>	Depth to Water (ft): <u>~8</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/10/93</u>	Elevation and Datum:
Drilling Method: <u>hollow stem auger</u>	Logged by: <u>DJS/JSB</u>	Checked by: <u>DJS</u>
Drilling Fluid: <u>none</u>	Number of Samples: <u>—</u>	Date: <u>9/22/93</u>



PROTECTIVE CSG  
Material / Type: Steel  
Diameter: 4"  
Depth BGS: \_\_\_\_\_ Weep Hole (Y/N)

GUARD POSTS (Y/N)  
No.: \_\_\_\_\_ Type: \_\_\_\_\_

SURFACE PAD  
Composition and Size: \_\_\_\_\_

RISER PIPE Schedule 40 PVC  
Type: \_\_\_\_\_  
Diameter: 2"  
Total Length (TOC to TOS): 8.5 -  
Ventilated Cap (Y/N)

GROUT  
Composition and Proportions: hole plug

Tremied (Y/N)

Interval BGS: \_\_\_\_\_

CENTRALIZERS  
Depth(s): N/A

SEAL bentonite pellets  
Type: \_\_\_\_\_  
Source: \_\_\_\_\_  
Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added \_\_\_\_\_

Tremied (Y/N)

FILTER PACK Global drilling supplies #7  
Type: \_\_\_\_\_  
AML Used: \_\_\_\_\_

Tremied (Y/N)

Source: Global drilling supplies

Gr. Size Dist: \_\_\_\_\_

SCREEN Schedule 40 PVC  
Type: \_\_\_\_\_  
Diameter: 2"  
Slot Size and Type: 0.010  
Interval BGS: 18.5 - 8.5

WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

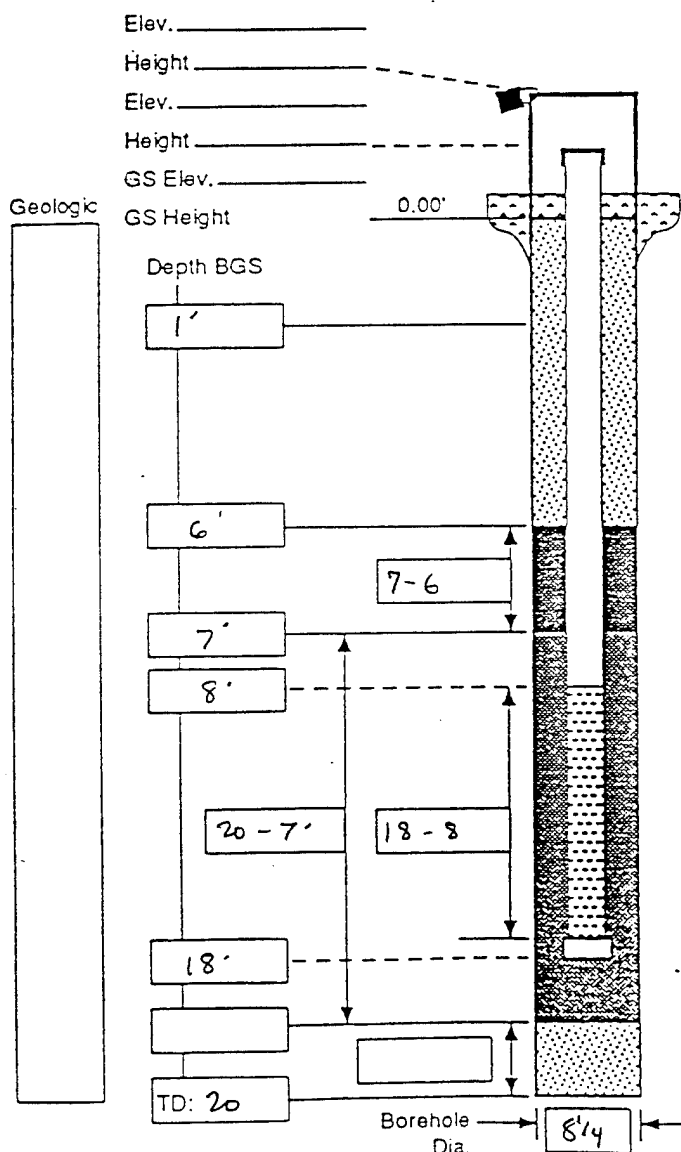
Bottom Cap (Y/N)

BACKFILL PLUG N/A  
Material: \_\_\_\_\_  
Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N)

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/11/93</u>
Well: <u>LF6MW4</u>	Well ID: <u>LF6MW4</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>4 1/4"</u>	Total Depth (ft): <u>20'</u>
Drilling Agency: <u>Stearns Drilling</u>	Date Started: <u>8/11/93</u>	Depth to Water (ft): <u>~9.5'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/11/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>hollow stem auger</u>	Logged by: <u>JS Bruegel</u>	Checked by: <u>JSB.</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSQ

Material / Type: Steel Casing

Diameter: 4"

Depth BGS: +2 - -2' Weep Hole (Y/N) (Y)

## GUARD POSTS (Y/N)

No. 4 Type: steel/concrete

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 2" PVC

Diameter: 2"

Total Length (TOC to TOS): 10' (#8' - +2')

Ventilated Cap (Y/N) (Y)

## GROUT

Composition and Proportions: hole plug -

200 lb - Baroid

Tremied (Y/N) JS 9/22/93

Interval BGS: 7-6' 6'-1.0'

## CENTRALIZERS

Depth(s) N/A

## SEAL

Type: Bentonite pellets - GEOSTORE

Source: Baroid - 141 man 7'-6'

Setup / Hydration Time: — Vol. Fluid Added: 5 gallon

Tremied (Y/N) (Y)

## FILTER PACK

Type: Global Drilling Supplies #7

AML Used: 7 50# bags

Tremied (Y/N) (Y) 20'-7'

Source: Global Drilling Supplies

Gr. Size Dist:

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 18'-8'

## WELL FOOT (Y/N)

Interval BGS: — Length: —

Bottom Cap (Y/N) (Y)

## BACKFILL PLUG

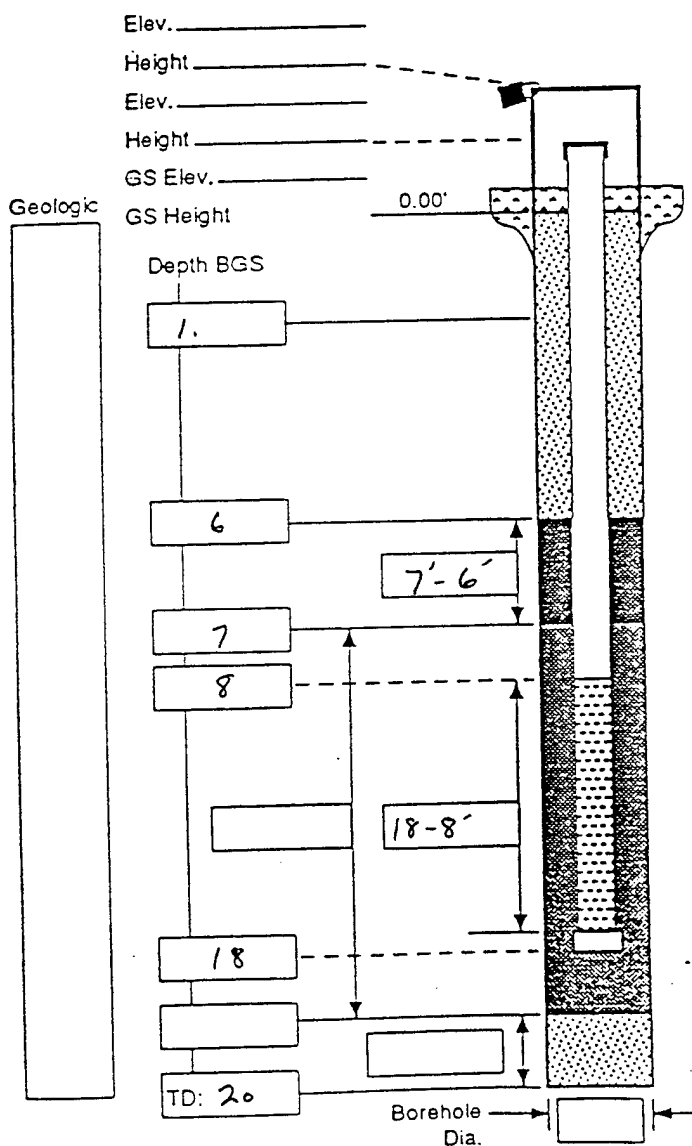
Material: —

Setup / Hydration Time: —

Tremied (Y/N) (Y)

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/11/93</u>
Well: <u>LF6MW5</u>	Well ID: <u>LF6MW5</u>	Sheet: <u>    </u> of <u>    </u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>4 1/4 I.D.</u>	Total Depth (ft): <u>20'</u>
Drilling Agency: <u>Stearns Drilling</u>	Date Started: <u>8/11/93</u>	Depth to Water (ft): <u>    </u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/11/93</u>	Elevation and Datum: <u>    </u>
Drilling Method: <u>Stearns Drilling</u>	Logged by: <u>JS/Smayel</u>	Checked by: <u>    </u>
Drilling Fluid: <u>none</u>	Number of Samples: <u>    </u>	Date: <u>    </u>



PROTECTIVE CSG  
Material / Type: Steel casing  
Diameter: 4"  
Depth BGS: -2' - +2' Weep Hole (Y/N)     

GUARD POSTS (Y/N)       
No.: 4 Type: steel/concrete - filled

SURFACE PAD  
Composition and Size: 2' x 2' concrete

RISER PIPE Schedule 40 PVC  
Type:       
Diameter: 2"  
Total Length (TOC to TOS): +2 to 8'  
Ventilated Cap (Y/N)     

GROUT  
Composition and Proportions: hole plug

Tremied (Y/N)      6'-1'  
Interval BGS:     

CENTRALIZERS N/A  
Depth(s):     

SEAL  
Type: pancrete pellets - Geostore  
Source: Brainerd K. Leman 7'-6'  
Setup / Hydration Time:      Vol. Fluid Added: 5 gallons

Tremied (Y/N)       
FILTER PACK Global Drilling Supplies #7  
Type: 7-50 # bags  
AML Used: 20'-7'  
Tremied (Y/N)      Global Drilling Supplies  
Source:     

Gr. Size Dist:     

SCREEN  
Type: Schedule 40 PVC  
Diameter: 2"  
Slot Size and Type: 0.010"  
Interval BGS: 8-18'

WELL FOOT (Y/N)       
Interval BGS:      Length:     

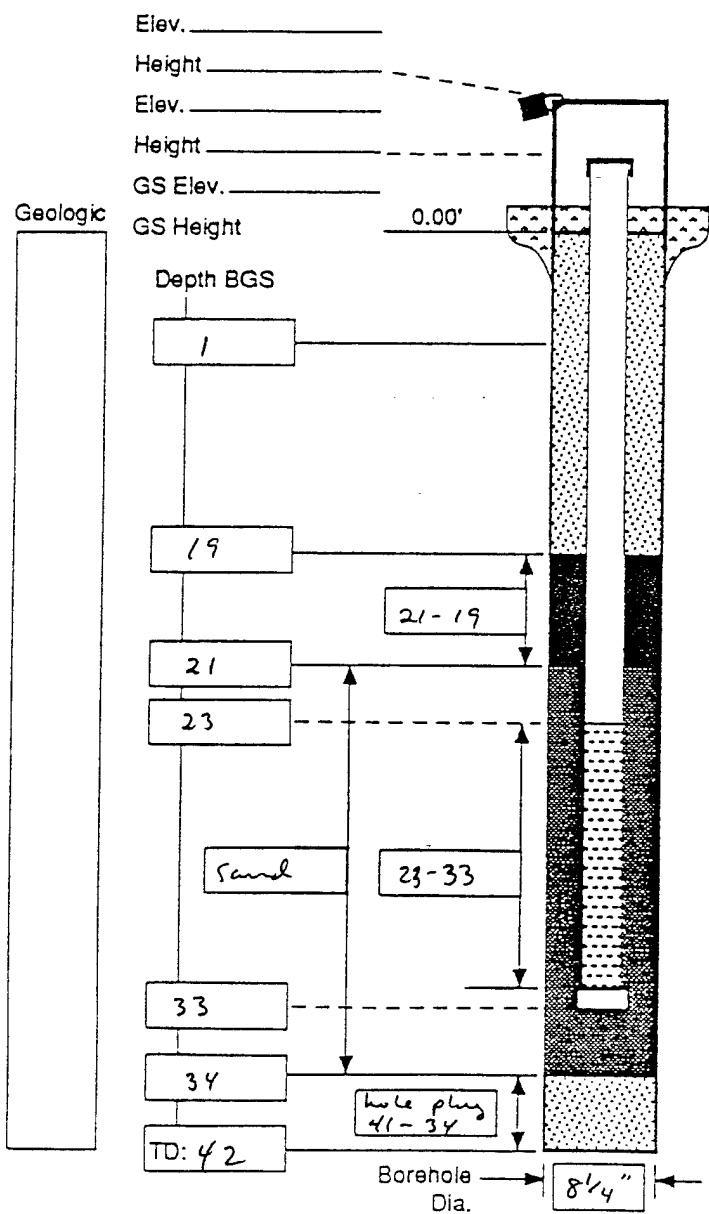
Bottom Cap (Y/N)     

BACKFILL PLUG  
Material: N/A  
Setup / Hydration Time:     

Tremied (Y/N)

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/22/93</u>
Well: <u>LF6 MW6</u>	Well ID: <u>LF6 MW6</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>42'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/14/93</u>	Depth to Water (ft): <u>~14</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/14/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DFS</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>



## PROTECTIVE CSG

Material / Type: Steel Casing

Diameter: 4"

Depth BGS: -2 to +2'

Weep Hole (Y/N) (N)

## GUARD POSTS (Y/N)

No.: 4 Type: steel/concrete-fill

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): -23 to +2'

Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: bentonite 19-1'

Tremied (Y/N) (N)

Interval BGS: 19-1'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: Bentonite pellets 21-19'

Source: Baroid (GEOSTORE)

Setup / Hydration Time: 5 Vol. Fluid Added

Tremied (Y/N) (N) gallons

## FILTER PACK

Type: Global #7

AML Used: 9 bags (50#)

Tremied (Y/N) (N) 34-21' BGS

Source: Global Drilling Supplies

Gr. Size Dist:

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010

Interval BGS: 23-33' BGS

## WELL FOOT (Y/N)

Interval BGS: - Length: -

Bottom Cap (Y/N) (N)

## BACKFILL PLUG

Material: bentonite (hole plug)

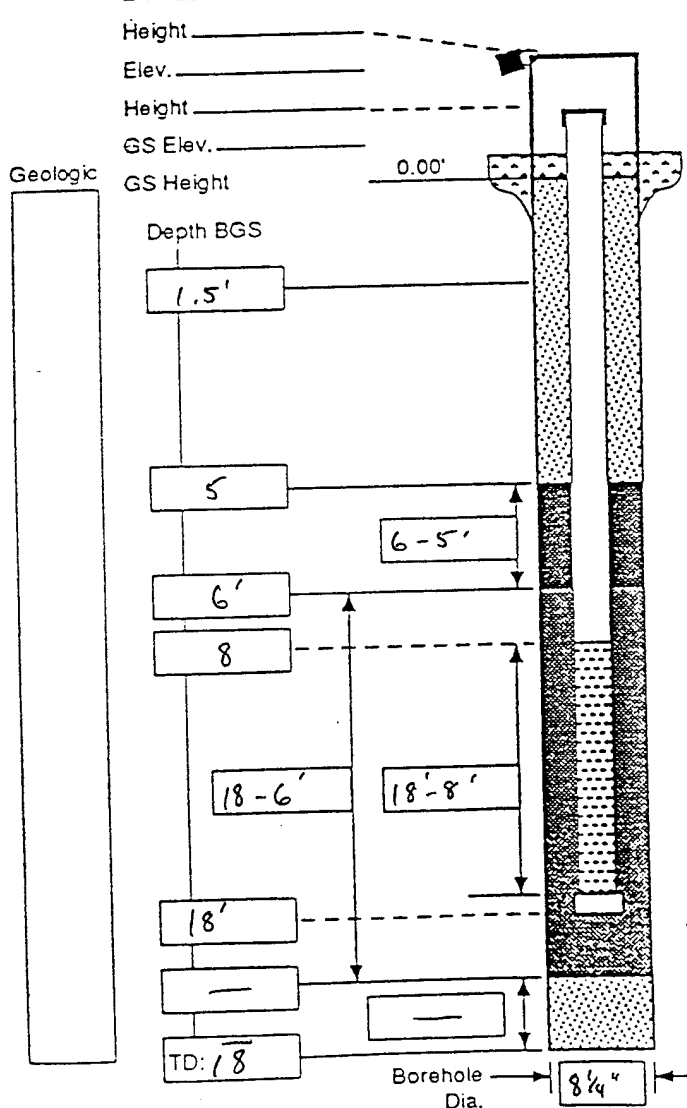
Setup / Hydration Time: 41-34'

Tremied (Y/N) (N) (through augers)

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/15/93</u>
Well: <u>LFGMW7</u>	Well ID: <u>LFGMW7</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>4 1/4" I.D.</u>	Total Depth (ft): <u>18'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/15/93</u>	Depth to Water (ft): <u>8.7</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/15/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>Hand Stump Auger</u>	Logged by: <u>DP Sayne</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>

Abandoned 9/9/93 - ~4' to surface filled w/ hole plug



PROTECTIVE CSG  
Material/Type: Steel Casing  
Diameter: 4"  
Depth BGS: ~2 - +2' Weep Hole ☒ (Y/N)

GUARD POSTS ☒ (Y/N)  
No: 4 Type: steel/concrete filled

SURFACE PAD  
Composition and Size: concrete 2' x 2'

RISER PIPE  
Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOG to TOS): -8 - +2'  
Ventilated Cap ☒ (Y/N)

GROUT  
Composition and Proportions: grout/cement/bentonite

Tremied ☒ (Y/N) 5 - 1.5'  
Interval BGS: —

CENTRALIZERS  
Depth(s): N/A

SEAL  
Type: Holeplug/pellets 6' - 5'  
Source: Baroid  
Setup / Hydration Time: — Vol. Fluid Added: 5 gallons

Tremied ☒ (Y/N)  
FILTER PACK  
Type: Global Filter pack  
Amt. Used: 9 50lb bags interval 18' - 6' BGS  
Tremied ☒ (Y/N) Global Drilling Supplies  
Gr. Size Dist: #7

SCREEN  
Type: Schedule 40  
Diameter: 8" O.D. 4" I.D.  
Slot Size and Type: 0.010"  
Interval BGS: 18' - 8'

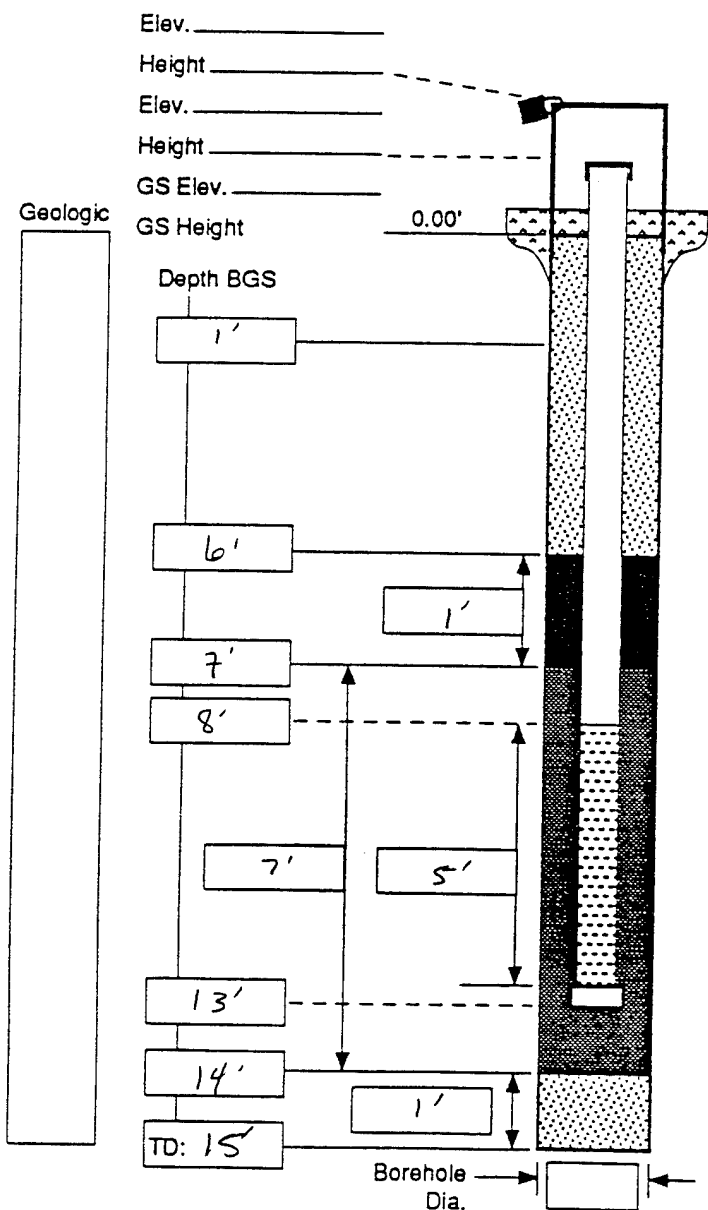
WELL FOOT ☒ (Y/N)  
Interval BGS: — Length: —

Bottom Cap ☒ (Y/N)

BACKFILL PLUG  
Material: 355 11/1/93  
Setup / Hydration Time: —  
Tremied ☒ (Y/N)

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/22/93</u>
Well: <u>LFGMW8</u>	Well ID: <u>LFGMW8</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>15'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/27/93</u>	Depth to Water (ft): <u>~9</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/27/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB/MCS</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>



## PROTECTIVE CSQ

Material / Type: steel casing

Diameter: 4"

Depth BGS: -2' to +2' Weep Hole (Y/N) (N)

## GUARD POSTS (Y/N)

No.: 4 Type: concrete filled steel

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): -8' to +2'

Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: Bentonite

Tremied (Y/N) (N)

Interval BGS: 6' - 1'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: Bentonite pellets

Source: Baroid 7'-6'

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: 5 gallons

Tremied (Y/N) (N)

## FILTER PACK

Type: Global #7

Amt. Used: 4 - 50 # bags

Tremied (Y/N) (N)

Source: Global Drilling Supplies

## Gr. Size Dist.

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 13' - 8'

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length \_\_\_\_\_

## Bottom Cap (Y/N)

## BACKFILL PLUG

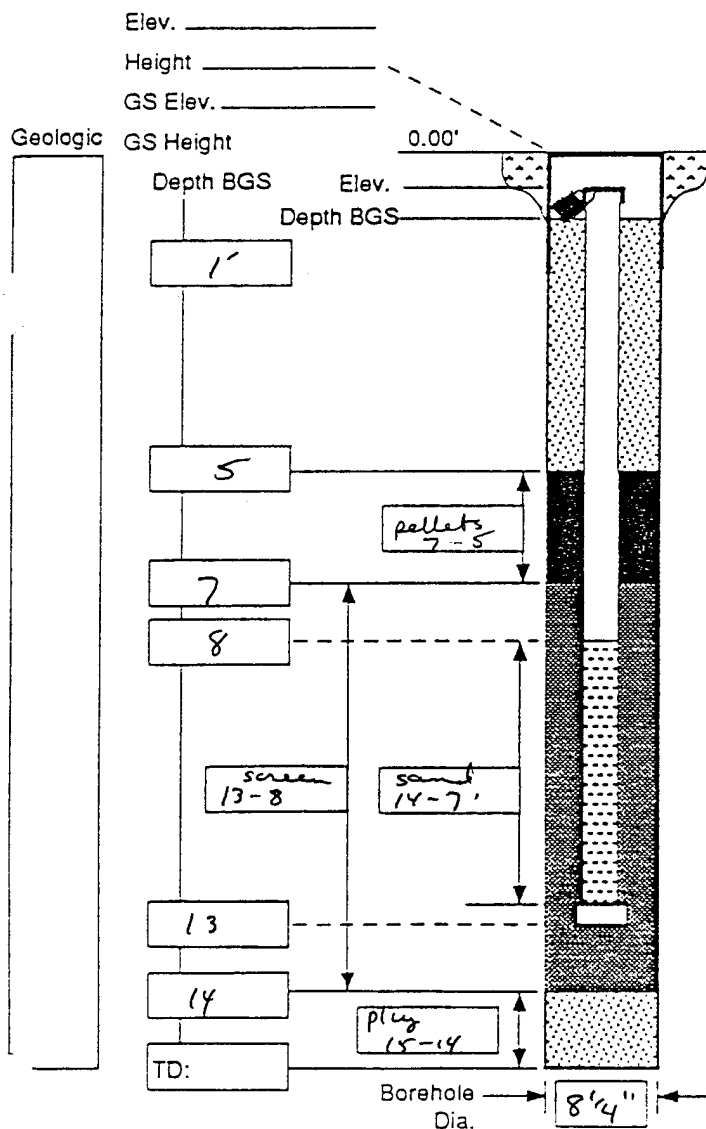
Material: hole plug (bentonite) 15'-14'

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) (N) through auger

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: _____
Well: <u>LF6MW9</u>	Well ID: <u>LF6MW9</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>16'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/27/93</u>	Depth to Water (ft): <u>~10'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/28/93</u>	Elevation and Datum: _____
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>MES</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: _____	Date: _____



## PROTECTIVE CSG

Material / Type: Steel Casing  
 Diameter: 4"  
 Depth BGS: -2 to +2' Weep Hole (Y/N) ☒

## GUARD POSTS (Y/N)

No.: 2 Type: concrete/steel  
350 9/22/93

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC  
 Diameter: 2"

Total Length (TOC to TOS): +2' to -8'

Ventilated Cap (Y/N) ☒

## GROUT

Composition and Proportions: bentonite  
-8' to -1' AGS

Tremied (Y/N) ☒

Interval BGS: 350 8' to 1'  
12/11/93

## CENTRALIZERS

Depth(s): NA

## SEAL

Type: Bentonite pellets  
 Source: Bovoid 7-5'

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added 5  
gallons

Tremied (Y/N) ☒

## FILTER PACK

Type: Global #7

Amt. Used: 4 50# bags

Tremied (Y/N) ☒

Interval BGS: 14-7'

Source: Global Drilling Supplies

Gr. Size Dist.:

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 13-8'

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) ☒

## BACKFILL PLUG

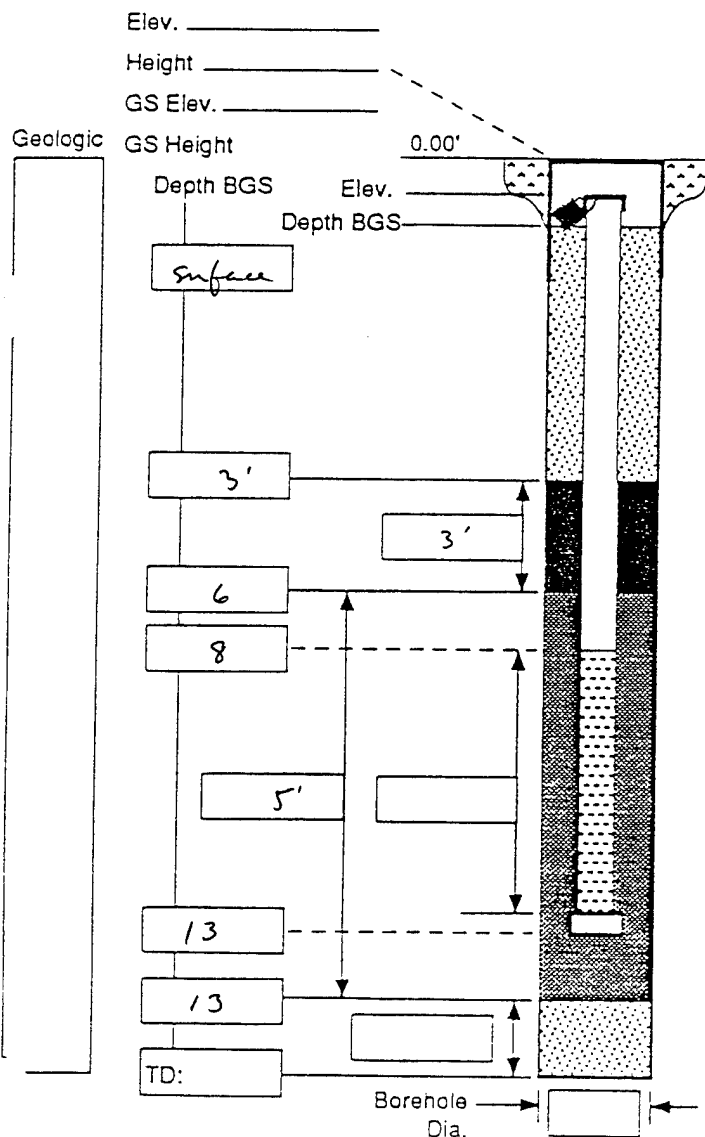
Material: hole plug 15-14'

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) ☒

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/22/93</u>
Well: <u>LFGMW10</u>	Well ID: <u>LFGMW10</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>9/12/93</u>	Depth to Water (ft): <u>~9'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/13/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB/DFS</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>



## PROTECTIVE CSG

Material / Type: Steel Casing

Diameter: 4"

Depth BGS: -2' to +2'

Weep Hole (Y/N) (Y)

## GUARD POSTS (Y/N)

No.: - Type: -

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): -8' to +2'

Ventilated Cap (Y/N) (Y)

## GROUT

Composition and Proportions: JSB 9/22/93 hole plug concrete 3' - surface

Tremied (Y/N) (N)

Interval BGS: \_\_\_\_\_

## CENTRALIZERS

Depth(s): NA

## SEAL

Type: bentonite 6' - 3'

Source: Buroid

Setup / Hydration Time: - Vol. Fluid Added: 15

Tremied (Y/N) (N) gallons

## FILTER PACK

Type: Global #7

Amt. Used: 4 - 50 lb bags

Tremied (Y/N) (N) 13 - 6'

Source: Global Drilling supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 13' - 8'

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) (Y)

## BACKFILL PLUG

Material: JSB 9/22/93

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) \_\_\_\_\_

## Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/11/93</u>
Well: <u>MWS</u>	Well ID: <u>HNBMWS</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>20'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>9/11/93</u>	Depth to Water (ft): <u>13'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/11/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DSayne</u>	Checked by: <u>Patricia Ly</u>
Drilling Fluid: <u>None</u>	Number of Samples:	Date: <u>9/22/93</u>

### PROTECTIVE CSQ

Material / Type:

Diameter:

Depth BGS: DF Weep Hole (Y / N)

GUARD POSTS (Y / N)

No.: 7/21/93 Type:

### SURFACE PAD

Composition and Size: Concrete 2' x 2'

### RISER PIPE

Type: schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): 10'

Ventilated Cap (Y / N)

### GROUT

Composition and Proportions: Bentonite 6' surface

Tremied (Y / N)

Interval BGS:

### CENTRALIZERS

Depth(s)

### SEAL

Type: bentonite 8'-6' BGS

Source:

Setup / Hydration Time: Vol. Fluid Added 10 gallons

Tremied (Y / N)

### FILTER PACK

Type: Global #17 silica SAND

Amt. Used: 7/5016 bags

Tremied (Y / N)

Source: Global Drilling Supplies 20'-8' BGS

Gr. Size Dist:

### SCREEN

Type: schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 9.5'-19.5' BGS

### WELL FOOT (Y / N)

Interval BGS: Length:

Bottom Cap (Y / N)

### BACKFILL PLUG

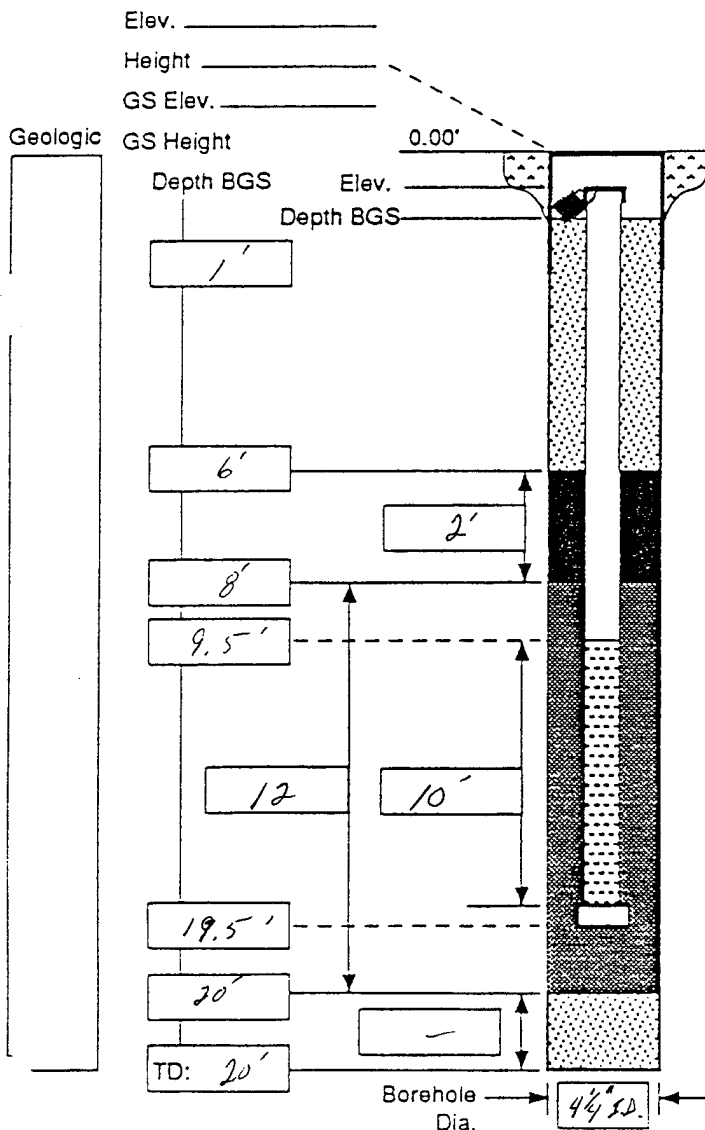
Material:

Setup / Hydration Time:

Tremied (Y / N)

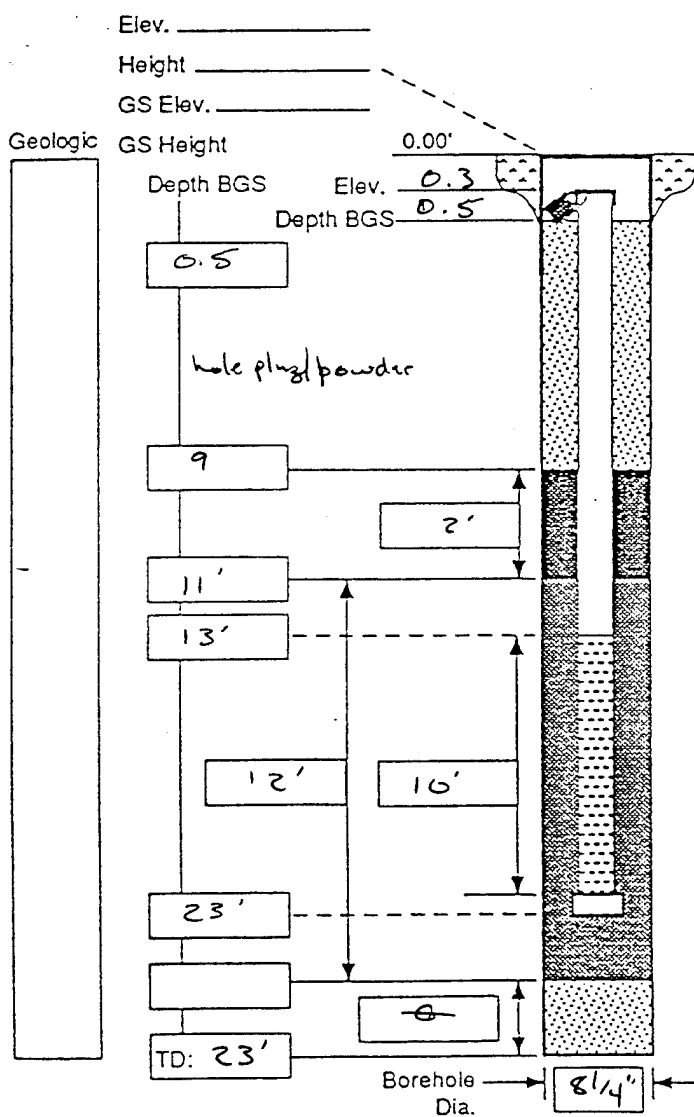
Form F-1023

9/1/91



# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG RI</u>	Project Number: <u>931800</u>	Date: <u>8/30/93</u>
Well location: <u>Site 9 Radar Tower</u>	Well ID: <u>MW6</u>	Sheet: <u>1 of 1</u>
Driller: <u>Dennis G. Ffels</u>	Borehole Diameter (in): <u>8 1/4"</u>	Total Depth (ft): <u>23'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/30/93</u>	Depth to Water (ft): <u>~ 16.3'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished:	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>P. H. Lag</u>	Checked by:
Drilling Fluid: <u>none</u>	Number of Samples: <u>—</u>	Date:



## PROTECTIVE CSG

Material / Type: Flushmount Steel

Diameter: \_\_\_\_\_

Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

## GUARD POSTS (Y/N)

No.: \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: 2x2' concrete

## RISER PIPE

Type: PVC Schedule 40

Diameter: 2" ID

Total Length (TOC to TOS): \_\_\_\_\_

Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: Portland Type I cement

Tremied (Y/N) (N)

Interval BGS: \_\_\_\_\_

## CENTRALIZERS

Depth(s): none

## SEAL

Type: Bentonite pellets / powder / hole plug

Source: \_\_\_\_\_

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: 5 gal

Tremied (Y/N) \_\_\_\_\_

## FILTER PACK

Type: Silica Sand

AML Used: 7 bags

Tremied (Y/N) (N)

Source: Global Drilling Supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: PVC Schedule 40

Diameter: 2" ID

Slot Size and Type: 1/8" slot 0.610"

Interval BGS: 13-23'

## WELL FOOT (Y/N) (N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) (N)

## BACKFILL PLUG

Material: n/a

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) \_\_\_\_\_

Form F-1025

## **Geotechnical Results**



# SUMMARY OF LABORATORY TEST RESULTS

Sample ID		Depth (ft)	Natural Moisture (%)	UNIT WEIGHT (PCF)		SPECIFIC GRAVITY	ATTERBERG LIMITS		Unified Soil Classification	Other Test **	Soil Description
				Wet	Dry		Liquid Limit (%)	Plasticity Index (%)			
P1 MW 10/ST-5		14.0 - 16.0	18.5	120.8	102.0	2.62	16	7	SM-SC	S,K	SAND, silty, clayey, brown
POS MW7/ST-3		18.0 - 20.0	14.1	138.9	121.8	2.76	12	6	SW	S,K	SAND, clayey, light brown with rock fragments
P3 B13/ST-1		53.0 - 55.0	19.7	108.7	90.8	2.75	21	11	CL	S,K	CLAY, silty, brown
LF6 MW7/ST-6		17.0 - 19.0	21.2	123.0	101.5	2.70	12	6	ML-CL	S,K	SILT, clayey, brown
P4 B15/ST-4		42.0 - 43.0	18.9			2.67	14	4	SM-SC	S	SAND, silty, clayey, brown Note: not enough sample for permeability
*P4 B15/ST-4		42.0 - 43.0	20.6	131.9	109.4	2.65	16	4	SM-SC	S,K	SAND, silty, clayey, brown
POZ B8/ST-2		55.0 - 56.0	17.8	137.9	117.1	2.70	30	16	CL	S,K	CLAY, silty, slightly sandy brown
*This is second attempt Shelby Tube Sample											

\*ST-SHELBY TUBE SAMPLE, SS-SPLIT SPOON SAMPLE, C-COMPOSITE SPLIT SPOON  
 \*\*TEST RESULTS REPORTED ON OTHER SHEETS:

K-PERMEABILITY      P-PROCTOR TEST  
 S-SIEVE OR GRAIN SIZE ANALYSIS      D-DIRECT SHEAR TEST  
 U-UNCONFINED COMPRESSION TEST      T-TRIAXIAL TEST

DATA CHECKED BY 

GA Technical Services

# SUMMARY OF CONSTANT HEAD PERMEABILITY METHOD ASTM D5084-90

Project : Earth Tech Lab Testing  
 Client : Earth Technology Corporation  
 Project No. : 3-4424-0000  
 Date : October 12, 1993

SAMPLE ID	SAMPLE LENGTH. in.	SAMPLE DIAMETER. in.	SAMPLE AREA. sq. ft.	DRY UNIT WT PCF	% MOISTURE	COEFFICIENT OF PERMEABILITY, cm/sec
P1MW10/ST-5 D14. - 16.	2.72	2.80	0.04276	102.0	18.5	$1.8 \times 10^{-4}$
POSMW7/ST-3 D18. - 20.	4.28	2.80	0.04276	121.8	14.1	$3.5 \times 10^{-5}$
P3 B13/ST-1 D53. - 55.	4.22	2.80	0.04276	90.8	19.7	$2.1 \times 10^{-6}$
LF6 MW7/ST-6 D17. - 19.	4.34	2.80	0.04276	101.5	21.2	$8.2 \times 10^{-6}$
*P4 B15/ST-4 D42. - 43.	3.41	2.80	0.04276	109.4	20.6	$1.4 \times 10^{-5}$
POZ B8/ST-2 D55. - 56.	4.16	2.80	0.04276	117.1	17.8	$1.2 \times 10^{-7}$

\*This is second attempt Shelby Tube Sample

SUMMARY OF CATION EXCHANGE CAPACITY  
METHOD EPA 9080

Project : Earth Tech Lab Testing  
Client : Earth Technology Corporation  
Project No. : 3-4424-0000  
Date : October 11, 1992

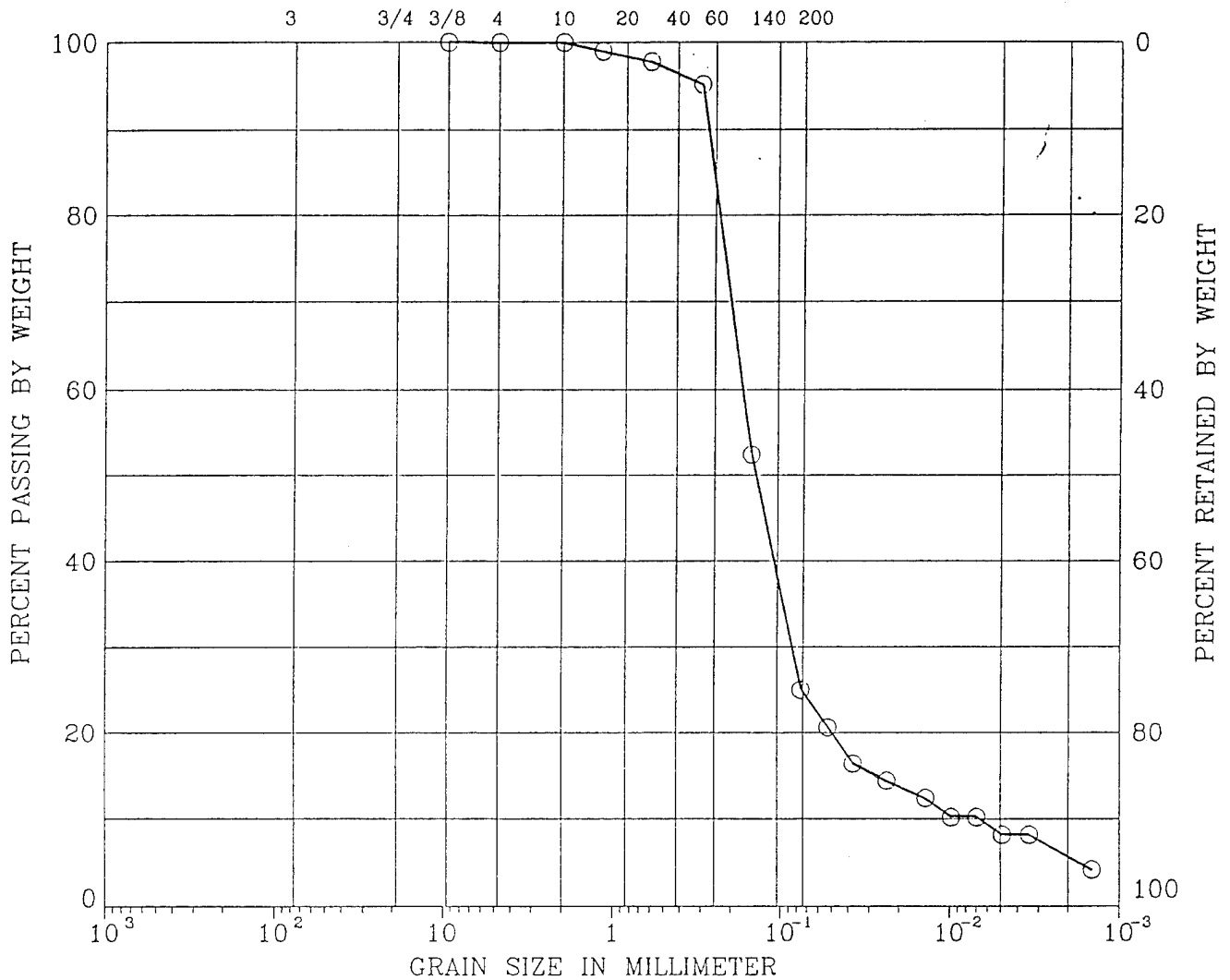
SAMPLE ID	TOTAL CATION EXCHANGE CAPACITY me/100g
P1MW10/ST-5 - D14. - 16.	40.9
POS MW7/ST-3 - D18. - 20.	15.6
P3 B13/ST-1-D 53. - 55.	24.2
LF6 MW7/ST-6-D17. - 19.	7.4
P4 B15/ST-4-D42.0 - 43.0	3.8
P4 B15/ST-4-D42.0 - 43.0	13.5
POZ B8/ST-2-D55. - 56.	29.2

\*This is second attempt Shelby Tube Sample

CHP/jh  
[3442400.sce]

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



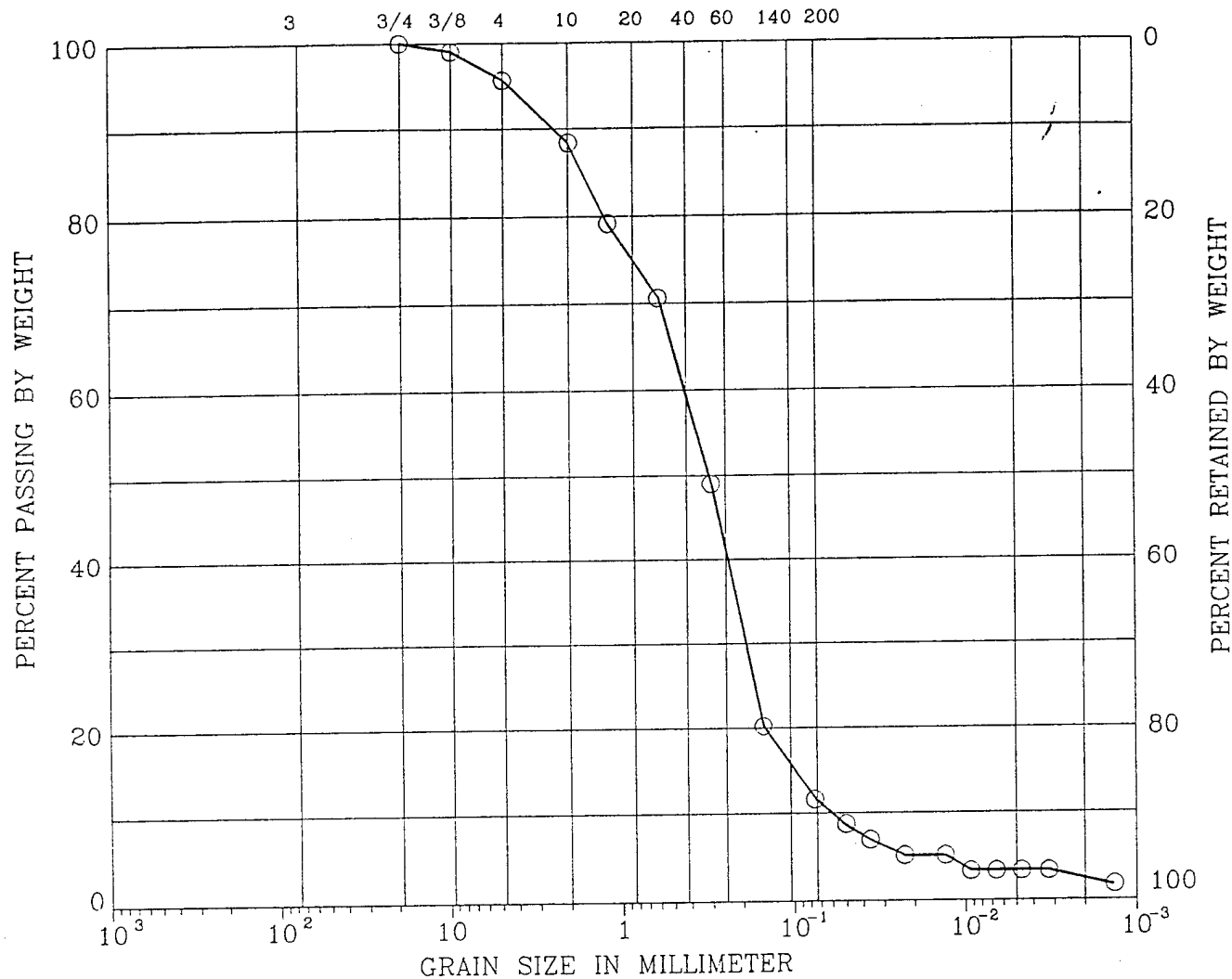
SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION	
○	P1MW10T5	14.-16.	16	7	SAND, silty, clayey, brown	USC=SM-SC

Remark : Earth Technology Corporation

Project No.3-4424	Earth Tech Lab Testing
G.A. TECHNICAL SERVICES	GRAIN SIZE DISTRIBUTION Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



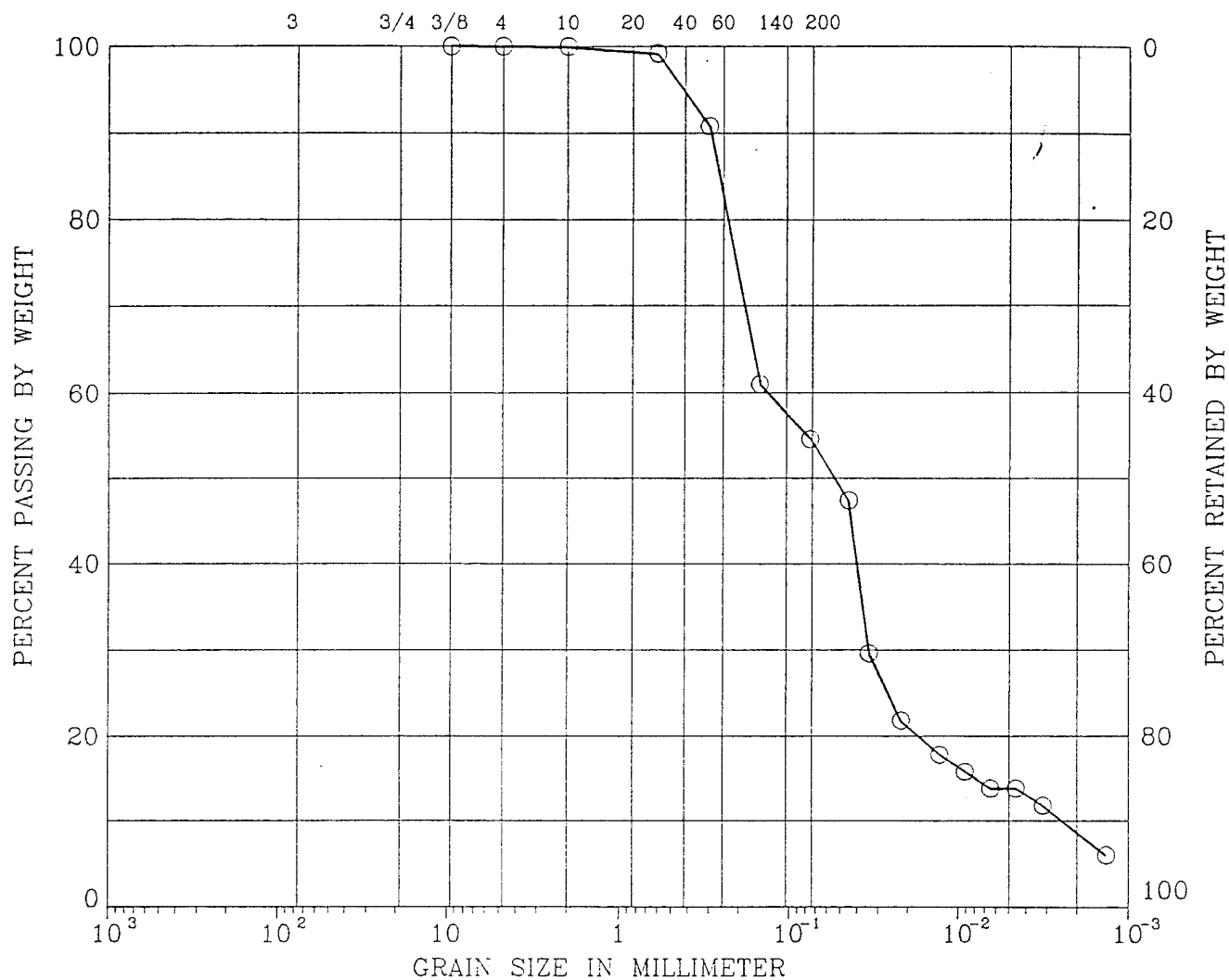
SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	POSMW7T3	18.-20.	12	6	SAND, cloyey, light brown w/rock fragments USC=SW

Remark : Earth Technology Corporation

Project No.3-4424	Earth Tech Lab Testing
G.A. TECHNICAL SERVICES	GRAIN SIZE DISTRIBUTION Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY,
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION	
○	P3B13/T1	53.-55.	21	11	CLAY, silty, brown	USC=CL

Remark : Earth Technology Corporation

Project No.3-4424

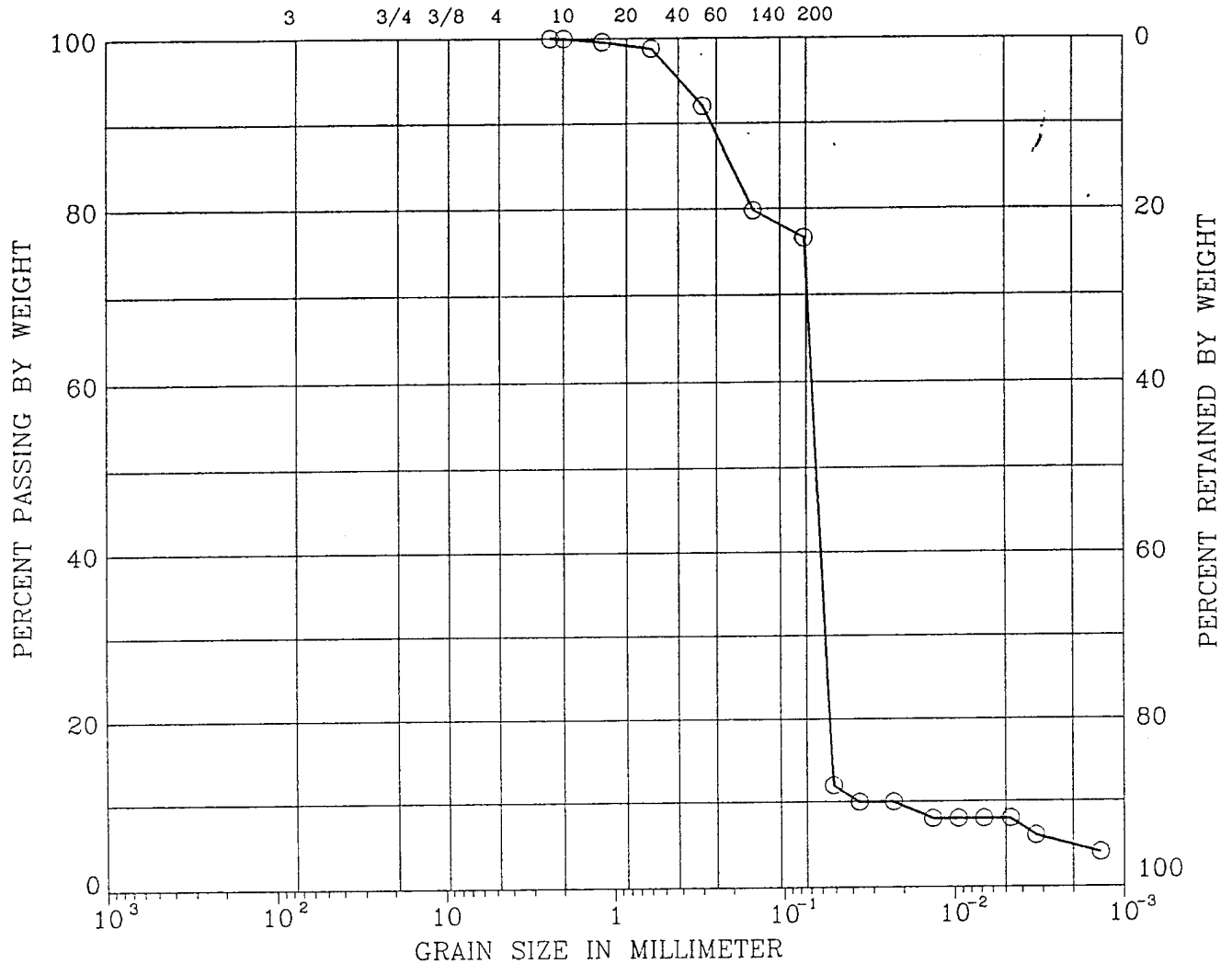
Earth Tech Lab Testing

G.A.  
TECHNICAL SERVICES

GRAIN SIZE DISTRIBUTION Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION	
○	LF6MW7T6	17.-19.	12	6	SILT, clayey, brown	USC=ML-CL

Remark : Earth Technology Corporation

Project No.3-4424

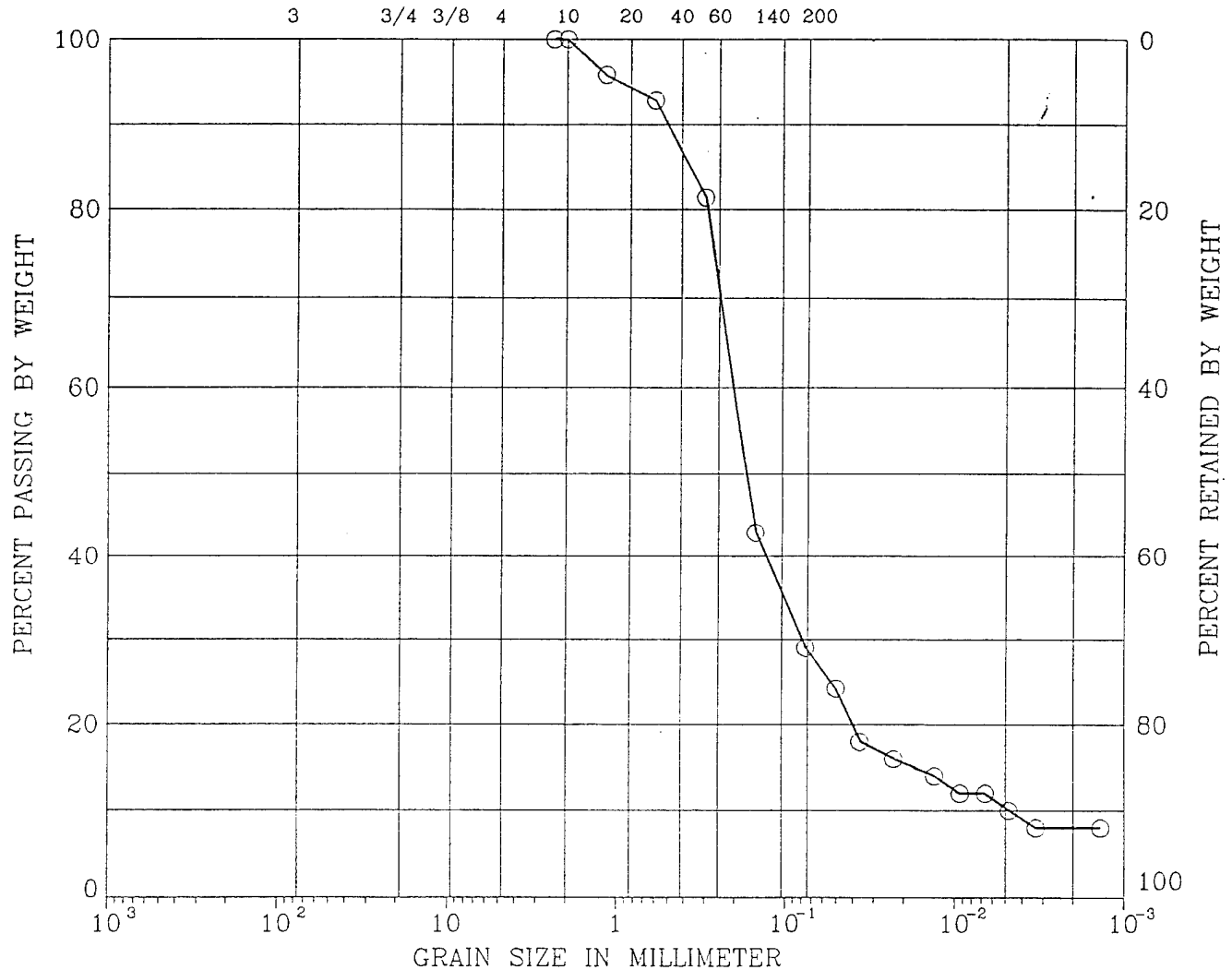
Earth Tech Lab Testing

G.A.  
TECHNICAL SERVICES

GRAIN SIZE DISTRIBUTION Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



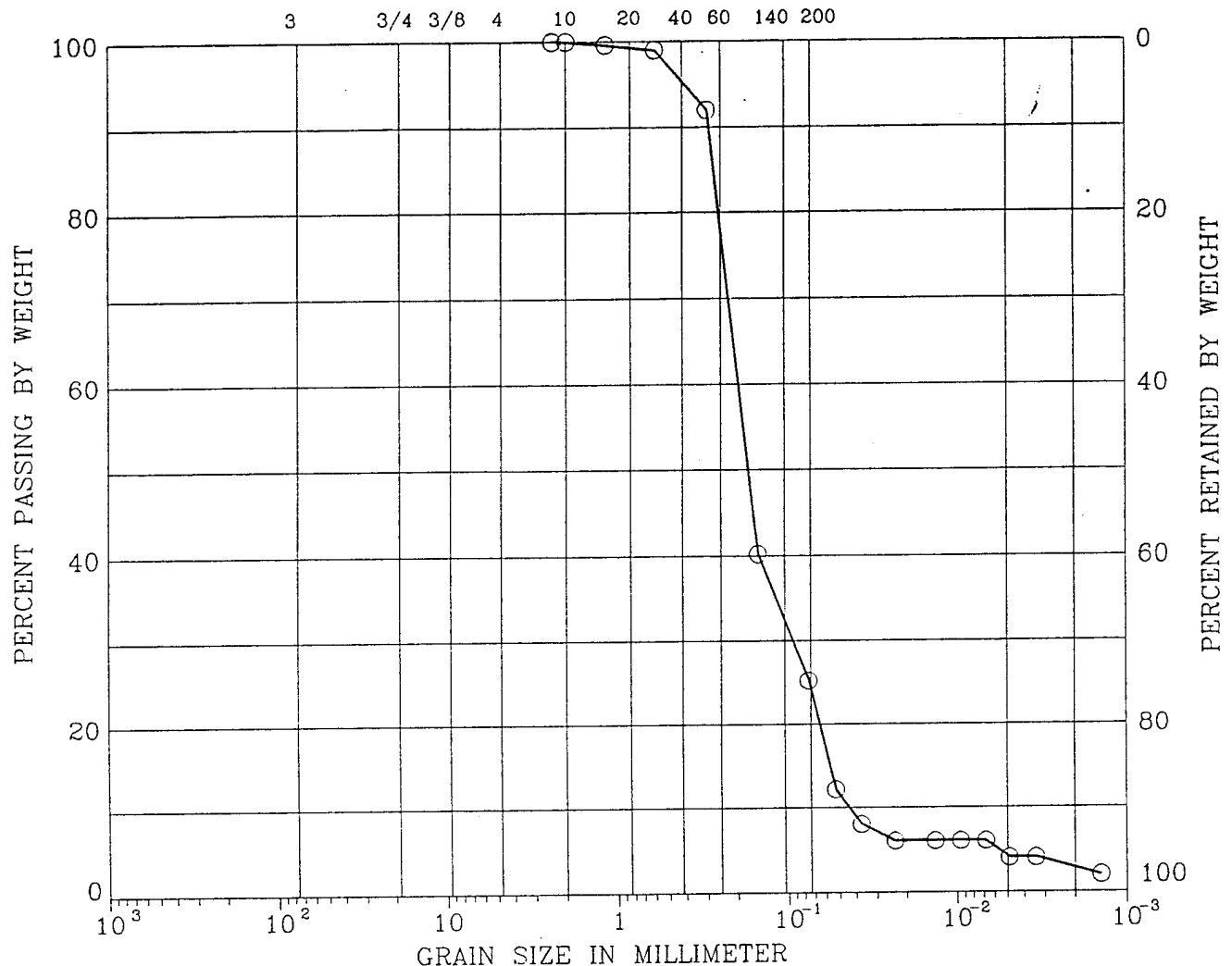
SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION	
○	P4B15/T4	42.-43.	14	4	SAND, clayey, silty, brown	USC=SM-SC

Remark : Earth Technology Corporation

Project No.3-4424	Earth Tech Lab Testing
G.A. TECHNICAL SERVICES	GRAIN SIZE DISTRIBUTION Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



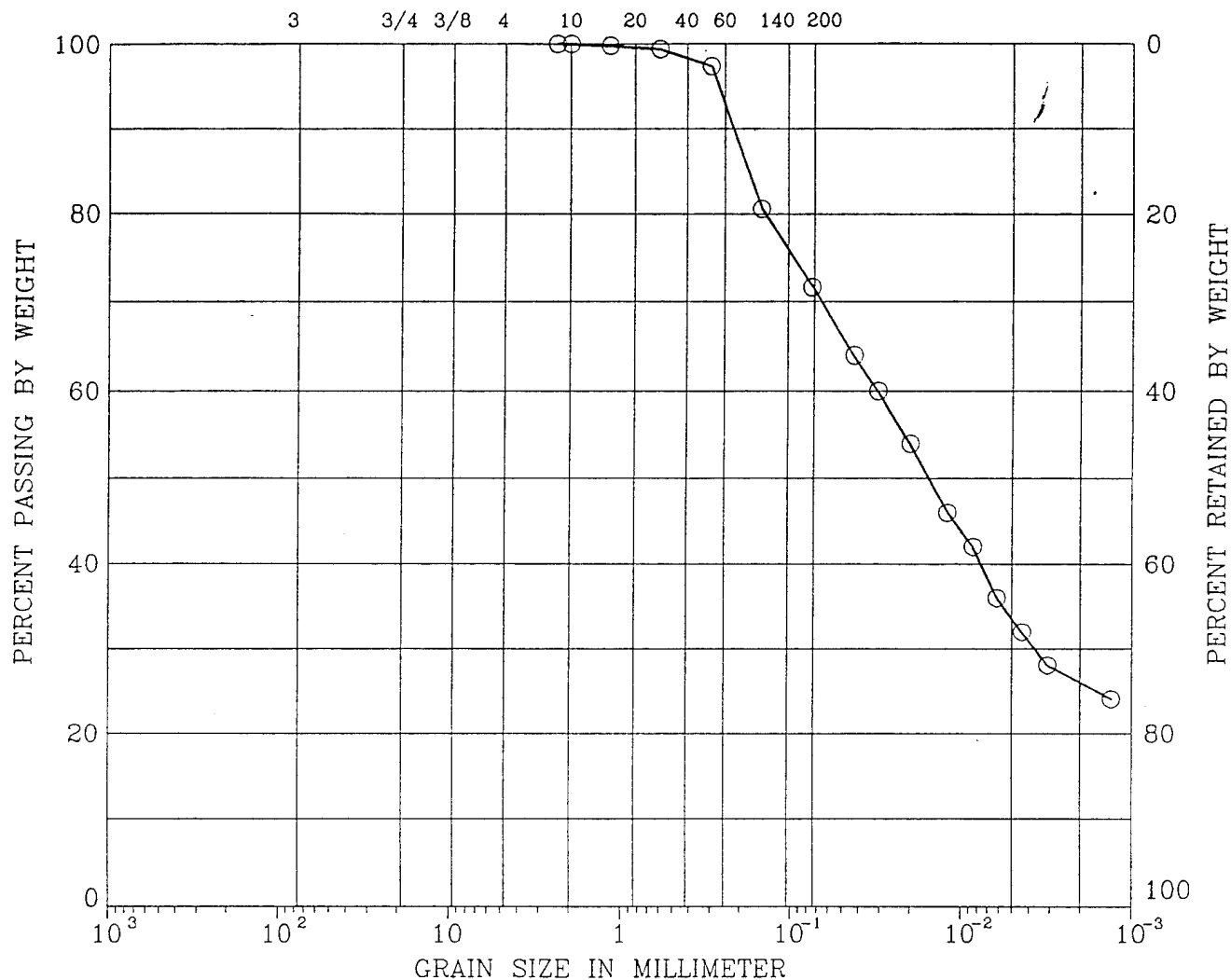
SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	P4B15/T4	42.-43.	16	4	SAND, slty, cly, br USC=SM-SC (2nd attemp sample)

Remark : Earth Technology Corporation

Project No.3-4424	Earth Tech Lab Testing
G.A. TECHNICAL SERVICES	GRAIN SIZE DISTRIBUTION Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. Sieve Size in Inches			U.S. Standard Sieve No.			Hydrometer



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION	USC
○	POZB8/T2	55.-56.	30	16	CLAY, silty, slightly sandy, brown	USC=CL

Remark : Earth Technology Corporation

Project No.3-4424	Earth Tech Lab Testing
G.A. TECHNICAL SERVICES	GRAIN SIZE DISTRIBUTION Sept. 23, 1993

**Appendix D: Analytical Results; Initial Site Screening**

### Explanation

JP-4	Jet Petroleum No.4
1,1-DCE	1,1-Dichloroethene
t-1,2-DCE	trans-1,2-Dichloroethene
c-1,2-DCE	cis-1,2-Dichloroethene
1,1,1-TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
PCE	Tetrachloroethene
Total Xylenes	Summation of Meta-, Para-, and Ortho-Xylene

The term "trace" indicates the compound was detected below the reportable quantitation limit. Quantitation limits are presented below.

#### COMPOUND

#### QUANTITATION LIMITS

	<u>Soil-Gas</u>	<u>Water</u>
• 1,1-Dichloroethene (DCE)	0.5 ppb	0.5 ppb
• trans-1,2-DCE	0.5 ppb	0.5 ppb
• cis-1,2-DCE	0.5 ppb	1.0 ppb
• 1,1,1-Trichloroethane (TCA)	0.05 ppb	0.05 ppb
• Trichloroethene (TCE)	0.05 ppb	0.05 ppb
• Tetrachloroethene (PCE)	0.05 ppb	0.05 ppb
• Benzene	50 ppb	5.0 ppb
• Toluene	50 ppb	5.0 ppb
• Ethylbenzene	50 ppb	5.0 ppb
• Total Xylenes	50 ppb	5.0 ppb
• Total Volatiles as JP4	20 ppm	22 ppb

**Table 1. Sample Results (JP-4)**

Sample results from November 1992 survey

Sample I.D.	Depth, ft.	JP-4 (ppm)
1SG-1	3	< 10
1SG-2	6	69
1SG-3	5	32
1SG-4	3	26
1SG-5	5	12000
1SG-6	5	18
1SG-7	5	62000
1SG-8	5	43
1SG-9	3	55000
1SG-10	3	14
1SG-11	5	130
1SG-12	5	43
1SG-13	5	45
1SG-14	3	< 10
1SG-15	5	12000
1SG-16	5	36
1SG-17	3	19
1SG-18	3	28
1SG-18 Dup.	3	14
1SG-19	5	< 10
1SG-20	3	10
1SG-21	5	12
1SG-22	5	< 10
1SG-23	5	53
1SG-23 Dup.	5	38
1SG-24	4	230
1SG-25	5	180
1SG-26	3	59
1SG-27	3	38
1SG-28	6	53
1SG-29	6	12000
1SG-30	3	100
1SG-31	9	67
1SG-32	6	< 10
1SG-33	6	< 10
1SG-34	3	9100
1SG-35	6	13000
1SG-36	6	7100
1SG-36 Dup.	6	3200
1SG-37	6	1700
16SG-1	3	17

**Table 1. Sample Results, Con'd.** \_\_\_\_\_

Sample results from November 1992 survey

Sample I.D.	Depth, ft.	JP-4 (ppm)
16SG-1	6	19
16SG-1	9	< 10
16SG-2	9	11
16SG-3	9	< 10
16SG-4	9	< 10
16SG-5	6	< 10
16SG-6	6	13
16SG-7	6	< 10
16SG-8	6	< 10
16SG-9	6	10
16SG-10	6	< 10
16SG-11	6	< 10
16SG-12	6	< 10
9SG-13	9	< 10
9SG-14	9	< 10
9SG-20	9	< 10
9SG-21	9	< 10
9SG-25	9	< 10

Results are in ppb

D-4

Table 1. JP-4 Data

Sample results from January 1993 survey

Sample I.D.	Depth, ft.	JP-4, ppm
<b>Soil Gas</b>		
8SG-1	3	32
8SG-1	6	< 20
8SG-1	9	24
8SG-2	3	21
8SG-3	6	< 20
8SG-4	9	< 20
8SG-5	9	< 20
8SG-6	3	< 20
8SG-6	6	< 20
8SG-6	9	< 20
8SG-7	6	< 20
8SG-8	6	< 20
8SG-9	6	30
8SG-10	6	< 20
8SG-11	6	< 20
8SG-12	6	24
8SG-13	6	< 20
8SG-14	6	< 20
8SG-15	6	< 20
8SG-16	6	< 20
8SG-17	6	< 20
8SG-17	12	< 20
8SG-18	6	< 20
8SG-19	6	< 20
* 1SG-1	6	19000
** 1SG-2	6	84000
2SG-1	6	< 20
2SG-2	6	< 20
2SG-3	6	25
2SG-4	6	< 20
2SG-5	6	24
2SG-5Dup.	6	21
2SG-6	6	20
2SG-7	6	< 20
2SG-8	3	< 20
2SG-8	5	< 20
2SG-9	5	< 20
2SG-10	5	< 20
2SG-11	5	< 20
2SG-12	5	< 20
2SG-13	5	22

\* taken in the area of 1SG-29 (November 1992) as a QC check

\*\* taken in the area of 1SG-36 (November 1992) as a QC check

Table 1. JP-4 Data (Con't)

Sample results from January 1993 survey

Sample I.D.	Depth, ft.	JP-4, ppm
2SG-14	5	47
2SG-15	5	< 20
2SG-16	5	< 20
2SG-17	5	24
2SG-18	5	< 20
2SG-19	5	< 20
2SG-20	5	26
2SG-21	5	< 20
2SG-22	5	< 20
2SG-23	5	< 20
2SG-24	2.5	< 20
2SG-24	5.5	< 20
2SG-25	5	< 20
2SG-26	5	< 20
2SG-27	5	< 20
2SG-28	5	< 20

Water

µg/L (ppb)

1GW-1	6-9	< 22
1GW-2	6-9	69
1GW-3	6-9	< 22
1GW-4	6-9	< 22
1GW-5	6-9	64
1GW-6	6-9	< 22
1GW-7	6-9	< 22
1GW-8	6-9	< 22
1GW-9	6-9	23
2GW-1	7-10	69
2GW-2	8-11	24
2GW-3	8-11	22
2GW-4	9-12	< 22
2GW-4 Dup.	9-12	< 22
2GW-5	9-12	< 22
2GW-6	9-12	22
2GW-6	18-21	22
2GW-6 Dup.	18-21	22
2GW-7	8-11	22
2GW-8	8-11	< 22
2GW-9	8-11	< 22
2GW-10	8-11	< 22
2GW-11	8-11	22
2GW-12	8-11	< 22

Table 1. JP-4 Data (Con't)

Sample results from January 1993 survey

Sample I.D.	Depth, ft.	JP-4, ppb
2GW-12 Dup.	8-11	< 22
5GW-1	6-9	< 22
5GW-2	-- 6-9	< 22
5GW-3	5-8	< 22
5GW-4	5-8	< 22
5GW-5	8-11	39
5GW-6	8-11	< 22
5GW-7	8-11	< 22
5GW-8	8-11	< 22
5GW-9	8-11	22
5GW-10	9-12	< 22
5GW-11	8-11	< 22
5GW-12	6-9	< 22
5GW-12 Dup.	6-9	< 22
5GW-13	6-9	< 22
5GW-14	6-9	< 22
5GW-15	6-9	22
5GW-16	6-9	25000
6GW-1	112-15	4400
6GW-2	15-18	22
6GW-2 Dup.	15-18	< 22
6GW-3	15-18	25
6GW-4	15-18	110
6GW-5	17-20	27
6GW-6	11-14	65
6GW-6 Dup.	11-14	110
6GW-7	8-11	< 22
6GW-8	14-17	< 22
6GW-8 Dup.	14-17	< 22
8GW-1	11-14	< 22
8GW-1	20-23	22
8GW-2	14-17	< 22
8GW-3	14-17	< 22
8GW-3	26-29	< 22
8GW-4	14-17	< 22
8GW-5	17-20	< 22
8GW-6	14-17	< 22
8GW-6 Dup.	14-17	< 22
8GW-7	14-17	< 22
8GW-8	18-21	< 22
8GW-9	17-20	< 22
8GW-9	26-29	23

Table 1. JP-4 Data (Con't)

Sample results from January 1993 survey

Sample I.D.	Depth, ft.	JP-4, ppb
9GW-1	18-21	< 22
9GW-1 Dup.	18-21	< 22
9GW-2	18-21	< 22
9GW-3	18-21	< 22
9GW-3 Dup.	18-21	< 22
9GW-4	18-21	< 22
9GW-5	15-21	< 22
9GW-6	18-21	23
9GW-6 Dup.	18-21	22
9GW-7	15-21	< 22
9GW-8	21-24	< 22
9GW-9	18-21	< 22
9GW-10	18-21	< 22
9GW-11	18-21	< 22
9GW-12	18-21	< 22
9GW-13	21-24	57
9GW-14	18-21	< 22
9GW-14 Dup.	18-21	< 22
9GW-15	21-24	< 22

13

Table 2. Target VOC Data  
Sample result from January 1993 survey

Sample No.	Results are in ppb								Benzene	Toluene	Ethylbenzene	Total Xylenes
	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE						
8SG-1-3'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-1-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-1-9'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-2-3'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-3-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-4-9'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-5-9'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-6-3'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-6-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-6-9'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-7-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-8-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-9-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-10-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-11-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-12-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-13-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-14-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-15-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-16-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-17-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-17-12'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
8SG-18-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
1SG-1-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		75000	8800	24000	5200	5200
1SG-2-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		11000	7100	9500	1100	1100
2SG-1-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
2SG-2-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
2SG-3-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
2SG-4-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
2SG-5-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
2SG-2 Dup-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
2SG-6-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
2SG-7-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50
2SG-8-3'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05		< 50	< 50	< 50	< 50	< 50

Table 2. Target VOC Data (Con't.)  
Sample result from January 1993 survey  
Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
2SG-8-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-9-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-10-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-11-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-12-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-13-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-14-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-15-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-16-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-17-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-18-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-19-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-20-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-21-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-22-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-23-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-24-2.5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-24-5.5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-25-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-26-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-27-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-28-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	0.21	< 50	< 50	< 50	< 50
Water										
1GW-1-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-2-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-3-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-4-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-5-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-6-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-7-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-8-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-9-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-1-7-10'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0

Table 2. Target VOC Data (Con't.)  
Sample result from January 1993 survey

Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
2GW-2-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-3-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-4-9-12'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-4 Dup.-9-12'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-5-9-12'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-6-9-12'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-6-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-6 Dup.-18-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-7-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-8-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	0.15	< 5.0	< 5.0	< 5.0	< 5.0
2GW-9-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-10-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-11-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-12-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-12 Dup.-8-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-1-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-2-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-3-5-8'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-4-5-8'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-5-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-6-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-7-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-8-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-9-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-10-9-12'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-11-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-12-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-12 Dup.-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-13-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-14-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-15-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-16-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-1-12-15'	< 0.5	< 0.5	< 1.0	< 0.05	0.02	0.15	1400	480	370	280
6GW-2-15-18'	< 0.5	< 0.5	< 1.0	< 0.05	1.30	< 0.05	270	120	110	27
	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0

Table 2. Target VOC Data (Con't.)  
Sample result from January 1993 survey

Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
6GW-2 Dup.-15-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-3-15-18'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-4-15-18'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-5-17-20'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-6-11-14'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-6 Dup.-11-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-7-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-8-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-8 Dup.-14-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-1-11-14'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-1-20-23'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-2-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-3-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-3-26-29'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-4-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	0.07	< 5.0	< 5.0	< 5.0	< 5.0
8GW-5-17-20'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-6-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-6 Dup.-14-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-7-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-8-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-9-17-20'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-9-26-29'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-1-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-1 Dup.-18-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-2-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-3-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-3 Dup.-18-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-4-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-5-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-6-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-6 Dup.-18-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-7-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-8-21-24'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-9-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	0.08	< 5.0	< 5.0	< 5.0	< 5.0

Table 2. Target VOC Data (Con't.)  
Sample result from January 1993 survey

Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
9GW-10-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-11-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	0.07	< 5.0	< 5.0	< 5.0	< 5.0
9GW-12-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-13-21-24'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-14-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-14 Dup.-18-	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-15-21-24'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0

Table 3. Laboratory Duplicates  
Sample results from November 1992 survey

Sample I.D.	JP-4, ppm	Results are in ppb									
		1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
1SG-17	19										
Lab Duplicate	13										
RPD	38%										
1SG-22	< 10										
Lab Duplicate	< 10										
RPD	0										
16SG-4	< 10										
Lab Duplicate	< 10										
RPD	0										
1SG-36	7100										
Lab Duplicate	7300										
RPD	3%										
9SG-7		< 0.50	< 0.50	< 0.50	< 0.050	< 0.050	< 0.030	< 50	< 50	< 200	< 200
Lab Duplicate		< 0.50	< 0.50	< 0.50	< 0.050	< 0.050	< 0.030	< 50	< 50	< 200	< 200
RPD		0	0	0	0	0	0	0	0	0	0
9SG-26		< 0.50	< 0.50	< 0.50	< 0.050	< 0.050	< 0.030	< 50	< 50	< 200	< 200
Lab Duplicate		< 0.50	< 0.50	< 0.50	< 0.050	< 0.050	< 0.030	< 50	< 50	< 200	< 200
RPD		0	0	0	0	0	0	0	0	0	0

Table 3. QA/QC Data  
Sample results from January 1993 survey

Soil-Gas Lab Duplicates		Results are in ppb									
Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes	
2SG-27-5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50	
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50	
RPD	0	0	0	0	0	0	0	0	0	0	
2SG-28-5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	0.20	< 50	< 50	< 50	< 50	
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	0.20	< 50	< 50	< 50	< 50	
RPD	0	0	0	0	0	0	0	0	0	0	
8SG-19	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50	
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50	
RPD	0	0	0	0	0	0	0	0	0	0	
8SG-1-3'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50	
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50	
RPD	0	0	0	0	0	0	0	0	0	0	
2SG-2	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50	
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50	
RPD	0	0	0	0	0	0	0	0	0	0	
2SG-22	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50	
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50	
RPD	0	0	0	0	0	0	0	0	0	0	
Water Lab Duplicates											
5GW-9	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0	
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0	
RPD	0	0	0	0	0	0	0	0	0	0	

Table 3. QA/QC Data (Con't.)

Sample results from January 1993 survey

Sample No.	Results are in ppb										Ethylbenzene	Toluene	Benzene	PCE	TCE	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	1,1-DCE
	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes									
1GW-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
1GW-3	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
1GW-8	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
2GW-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
2GW-4	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
2GW-6	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
9GW-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
9GW-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									

Table 3. QA/QC Data (Con't.)

Sample results from January 1993 survey

Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
9GW-4	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
RPD	0	0	0	0	0	0	0	0	0	0
<b>Water Matrix Spikes</b>										
2GW-7	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-7 spike	1.8	2.3	2.7	0.11	0.22	0.14	6.8	6.2	4.7	5.4
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	96	123	144	58	116	74	71	65	49	57
8GW-3	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-3 Spike	2.1	2.7	3.0	0.13	0.25	0.17	8.0	7.3	5.2	6.4
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	111	142	158	68	132	89	84	77	55	67
8GW-6	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-6 Spike	1.8	2.3	2.8	0.10	0.22	0.12	7.0	6.3	4.6	5.6
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	95	121	147	53	116	63	74	66	48	59
2GW-5	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-5 Spike	1.8	2.3	2.8	0.10	0.22	0.13	6.8	6.2	4.6	5.4
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	95	121	147	53	116	68	71	65	48	57
9GW-3	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-3 Spike	1.3	1.7	2.4	0.09	0.25	0.11	7.3	6.4	4.2	5.0
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	68	89	126	47	132	58	77	67	44	53

Table 3. QA/QC Data (Con't.)

Sample results from January 1993 survey

Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
9GW-11	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-11 Spike	1.2	1.3	2.0	0.07	0.22	0.14	6.0	5.3	4.0	4.4
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	63	68	105	37	116	74	63	56	42	46
9GW-12	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-12 Spike	1.2	1.5	2.2	0.08	0.23	0.11	6.8	5.8	4.1	4.7
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	63	79	116	42	121	58	71	61	43	49
Equipment Rinseate Blanks										
EB-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
EB-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
EB-3	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
EB-4	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
EB-5	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0

## Laboratory Blanks

All instrument, syringe, vial and syringe blanks were below reporting limits.

## **Appendix E: Analytical Results; Onsite Screening**



### Explanation

t-1,2-DCE	trans-1,2-Dichloroethene
c-1,2-DCE	cis-1,2-Dichloroethene
TCE	Trichloroethene
PCE	Tetrachloroethene
EB	Ethylbenzene
M/P-Xylene	Summation of Meta- and Para-Xylene
O-Xylene	Ortho-Xylene

Samples in this Appendix are to be denoted as follows;

Suffix-Sample ID ending	Meaning
A,B,C, ect.	indicate a soil sample
AW,BW,CW, etc. and H1,H2,H3, etc.	indicate groundwater samples collected utilizing a Hydro-punch
AA,BB,CC, etc.	indicate groundwater samples collected after development and purge utilizing a bailer.
AHA,AHB,AHC, etc.	indicate a sediment sample collected utilizing a hand auger

Note: QA and ER samples correspond to sampling activities on that date and are site specific.

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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P1B12A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/26/93
P1B13A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/26/93
P1B13B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/26/93
P1B4A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B5A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B5A LABDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B5B	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B6A	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1B6B	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1B7B	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B8A	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1B9A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B9B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1MW10A	BM	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/29/93
P1MW10AA LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	SOIL	09/09/93
P1MW10AA LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	SOIL	09/09/93
P1MW10AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	WATER	08/29/93
P1MW10B	2	ND	304	ND	ND	ND	ND	ND	ND	6-8	SOIL	08/29/93
P1MW10BB	ND	ND	ND	ND	ND	ND	ND	ND	ND	4	WATER	08/29/93
P1MW10BB FIELD DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	4	WATER	08/29/93
P1MW10BW	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	WATER	08/30/93
P1MW10C	BM	ND	472	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/29/93
P1MW10C FIELDDDUP	2	ND	518	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/29/93
P1MW10D	ND	ND	ND	ND	ND	ND	ND	ND	ND	10-12	SOIL	08/29/93
P1MW11A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/30/93
P1MW11AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	15	WATER	08/30/93
P1MW11B	ND	ND	ND	ND	ND	ND	ND	ND	ND	7-9	SOIL	08/30/93
P1MW11BB	ND	ND	ND	ND	ND	ND	ND	ND	ND	4	WATER	09/08/93
P1MW11C	ND	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/30/93
P1MW11D	ND	ND	ND	ND	ND	ND	ND	ND	ND	11-13	SOIL	08/30/93
P1MW12A	ND	ND	ND	ND	ND	ND	ND	ND	ND	5-7	SOIL	09/08/93
P1MW12B	ND	ND	ND	ND	ND	ND	ND	ND	ND	7-9	SOIL	09/08/93

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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P1MW12C	ND	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	09/08/93
P1MW12D	ND	ND	ND	ND	ND	ND	ND	ND	ND	11-13	SOIL	09/08/93
P1MW12D LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	11-13	SOIL	09/08/93
P1MW12E	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	09/08/93
P1MW13A	ND	ND	ND	ND	ND	ND	ND	ND	ND	7-9	SOIL	09/09/93
P1MW13AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	09/08/93
P1MW13B	ND	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	09/09/93
P1MW13C	ND	ND	ND	ND	ND	ND	ND	ND	ND	11-13	SOIL	09/09/93
P1MW13D	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	09/09/93
P1MW13D LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	09/09/93
P1MW13ER1	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	09/09/93
P1MW13ERZ	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	09/09/93
P1MW14AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	25	WATER	09/11/93
P1MW14AW FIELDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	25	WATER	09/11/93
P1MW14AW LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	25	WATER	09/11/93
P1MW1AW	17	2	44	77	4	28	103	348	ND	7	WATER	08/24/93
P1MW1BW	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	WATER	08/24/93
P1MW1BW FIELDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	WATER	08/24/93
P1MW1BW LABDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	WATER	08/24/93
P1MW1CW	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	31	WATER	08/24/93
P1MW1ER	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/24/93
P1MW2A	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	SOIL	09/08/93
P1MW2AA	2	ND	ND	BMDL	6	ND	ND	ND	ND	4	WATER	08/30/93
P1MW2AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	08/26/93
P1MW2AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	09/08/93
P1MW3AW	ND	ND	ND	16	56	ND	ND	ND	ND	7	WATER	08/26/93
P1MW4AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	WATER	08/30/93
P1MW4AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	08/27/93
P1MW4AW LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	08/27/93
P1MW5A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/28/93
P1MW5AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/28/93
P1MW5AW LABDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/28/93
P1MW6A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/28/93

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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P1MW6A LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/28/93
P1MW6AA	ND	31	54	46	ND	20	199	437	ND	4	WATER	08/30/93
P1MW6AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/28/93
P1MW6B	ND	14	882	144	ND	ND	1776	4436	ND	9-11	SOIL	08/29/93
P1MW7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/28/93
P1MW7AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/28/93
P1MW8A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/29/93
P1MW8A	ND	20	328	ND	ND	ND	372	1160	ND	1-3	SOIL	08/30/93
P1MW8AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/28/93
P1MW8C	10	ND	774	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/30/93
P1MW8D	ND	ND	798	ND	ND	ND	ND	ND	ND	12	SOIL	08/30/93
P1MW8D LABDUP	ND	ND	812	ND	ND	ND	ND	ND	ND	12	SOIL	08/30/93
P1MW9A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/29/93
P1MW9AA	2	10	4	12	ND	8	BMDL	14	8	5	WATER	08/29/93
P1MW9AW	ND	3	BMDL	ND	14	6	ND	ND	ND	6	WATER	08/28/93
P1PZ3	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	WATER	08/24/93
P1SB4B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1TW15A	ND	ND	ND	ND	ND	ND	ND	ND	ND	5-7	SOIL	09/12/93
P1TW15AW	2	ND	ND	1	ND	BMDL	ND	4	ND	9	WATER	09/12/93
S1MW11A FIELD DUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	SOIL	08/31/93
S1MW11A LAB DUP	ND	ND	166	ND	ND	ND	ND	ND	ND	3	SOIL	08/31/93
S1MW11AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	WATER	08/31/93
P2MW6A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/16/93
P2MW6AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8	WATER	08/24/93
P2MW6BB	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	09/09/93
P2MW6C	ND	ND	ND	ND	ND	ND	ND	ND	ND	14-16	SOIL	08/16/93
P2MW6C	ND	ND	ND	1	ND	ND	ND	ND	ND	14-16	SOIL	08/17/93
P2MW6D	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	SOIL	08/17/93
P2MW6H1	ND	ND	1	BMDL	BMDL	ND	ND	ND	ND	12	WATER	08/16/93
P2MW6H2	EM	3	BMDL	ND	ND	ND	ND	ND	ND	27	WATER	08/16/93
P2MW6H3	ND	ND	ND	ND	ND	ND	ND	ND	ND	42	WATER	08/16/93
P2MW7A	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	0-2	SOIL	08/18/93

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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P2MW7A LAB DUP	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	0-2	SOIL	08/18/93
P2MW7AA	ND	ND	1	ND	ND	9	ND	ND	ND	7	WATER	08/24/93
P2MW7B	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	4-6	SOIL	08/18/93
P2SB2A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/14/93
P2SB2B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/14/93
P2SB2C	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/14/93
P2SB2D	ND	ND	ND	ND	ND	ND	ND	ND	ND	6-8	SOIL	08/14/93
P2SB3A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/14/93
P2SB3B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/14/93
P2SB3C	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/14/93
P2SB3D	ND	ND	ND	ND	ND	ND	ND	ND	ND	6-8	SOIL	08/14/93
P2SB4A	ND	BM	ND	ND	ND	4	ND	ND	ND	0-2	SOIL	08/14/93
P2SB4A LABDUP.	ND	BM	ND	ND	ND	3	ND	ND	ND	0-2	SOIL	08/14/93
P2SB4B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/14/93
P2SB4C	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	4-6	SOIL	08/14/93
P2SB4D	ND	BM	ND	ND	ND	1	ND	ND	ND	6-8	SOIL	08/14/93
P2SB5A	ND	BM	ND	ND	ND	13	ND	ND	ND	0-2	SOIL	08/14/93
P2SB5B	ND	ND	ND	ND	ND	2	ND	ND	ND	2-4	SOIL	08/14/93
P2SB5C	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	4-6	SOIL	08/14/93
P2SB5D	ND	ND	ND	ND	ND	2	ND	ND	ND	6-8	SOIL	08/14/93
P2SB6A	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	2-4	SOIL	08/15/93
P2SB6B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P2SB7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/15/93
P2SB7B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P2SB7B LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P2SB8A	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/15/93
P2SB8B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P2SB8C	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/15/93
P2SB9A	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P2SB9A	ND	ND	ND	ND	ND	1	ND	ND	ND	54-56	SOIL	08/16/93
P2SB9B	ND	ND	ND	ND	ND	1	ND	ND	ND	0-2	SOIL	08/17/93
P2SB9B	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/17/93
P2SB9B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/17/93
P3MW6AA	ND	ND	ND	ND	ND	ND	ND	3	ND	14	WATER	08/30/93

Analytical Results from On-Site Field GC  
Alpena CRTIC, Alpena MI  
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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P3MW6AW	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	17	WATER	08/25/93
P3MW6BW	2	16	2	3	BMDL	ND	ND	ND	ND	27	WATER	08/26/93
P3MW6C	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	08/25/93
P3MW6C LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	08/25/93
P3MW7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	3-5	SOIL	08/31/93
P3MW7AW	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	19	WATER	08/30/93
P3MW7B	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/31/93
P3MW7BW	ND	ND	ND	ND	ND	ND	ND	ND	ND	29	WATER	08/30/93
P3MW7C	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	08/31/93
P3MW7CW	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	39	WATER	08/30/93
P3P21A	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	SOIL	08/25/93
P3P21AA	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	3	WATER	08/30/93
P3P21B	ND	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/25/93
P3P21B LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	SOIL	08/25/93
P3P21C	ND	ND	ND	ND	ND	ND	ND	34	116	18	SOIL	08/25/93
P3P22AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	WATER	08/29/93
P3P26A	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	SOIL	08/25/93
P3SB11A	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/26/93
P3SB11A LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/26/93
P3SB11B	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/26/93
P3SB11C	ND	ND	ND	ND	ND	ND	ND	ND	ND	10-12	SOIL	08/26/93
P3SB12A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/26/93
P3SB12B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/26/93
P3SB12C	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/26/93
P3SB12D	ND	ND	ND	ND	ND	ND	ND	ND	ND	10-12	SOIL	08/26/93
P3SB12D LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	10-12	SOIL	08/26/93
P3SB13A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/26/93
P3SB13B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/26/93
P3SB13C	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/26/93
P3SB13D	ND	ND	ND	ND	ND	ND	ND	ND	ND	10-12	SOIL	08/26/93
P3SB13HP1	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	17	WATER	08/26/93
P4B15A	ND	ND	BMDL	BMDL	ND	BMDL	ND	ND	ND	0-2	SOIL	08/11/93

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Alpena CRTG, Alpena MI  
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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P4B15B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/11/93
P4B15C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/11/93
P4B15D	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	14-16	SOIL	08/11/93
P4B15E	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	19-21	SOIL	08/11/93
P4B15E DUP.	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	19-21	SOIL	08/11/93
P05MW5AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/24/93
P05MW6AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/24/93
P05MW7AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	08/24/93
P5MW5A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/12/93
P5MW5B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/12/93
P5MW5C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/12/93
P5MW6A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/12/93
P5MW6B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/12/93
P5MW6B LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/12/93
P5MW6D	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	19.5	SOIL	08/12/93
P5MW6E	9	24	12	5	19	6	12	12	12	21	SOIL	08/12/93
P5MW7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/12/93
P5MW7A LAB DUP	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/12/93
P5MW7B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/12/93
P5MW7C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	9	SOIL	08/12/93
P5MW7D	ND	ND	4	ND	ND	ND	ND	ND	ND	20	SOIL	08/12/93
P5MW7D DUP	ND	ND	3	ND	ND	ND	ND	ND	ND	20	SOIL	08/12/93
P5TW10AW	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	20	WATER	09/10/93
P5TW8AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	09/08/93
P5TW8AW	ND	8	30	BMDL	ND	ND	ND	ND	ND	19	WATER	08/31/93
P5TW8AW FIELDUP.	ND	8	34	ND	ND	ND	ND	ND	ND	19	WATER	08/31/93
P5TW8AW LABDUP.	ND	8	30	2	ND	ND	ND	ND	ND	9	SOIL	09/09/93
P5TW9AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	WATER	09/09/93
P5TW9BW	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	WATER	09/09/93
P5TW9CW	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	WATER	09/09/93
P5TW9CW	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	WATER	09/09/93

Analytical Results from On-Site Field GC  
Alpena CRTC, Alpena MI  
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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
LF6AHA	ND	ND	BMDL	ND	BMDL	ND	ND	ND	ND	1	SOIL	09/11/93
LF6AHB	ND	ND	BMDL	ND	BMDL	ND	ND	ND	ND	1	SOIL	09/11/93
LF6AHC	ND	ND	ND	4	ND	ND	14	ND	ND	1	SOIL	09/11/93
LF6AHC LABDUP.	ND	ND	BMDL	4	ND	2	12	ND	ND	1	SOIL	09/11/93
LF6ER	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	09/11/93
P06MW4AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	WATER	08/24/93
P06MW5AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	WATER	08/24/93
P6MW4A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/11/93
P6MW4B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/11/93
P6MW4B SPIKE	67	82	91	100	166	112	160	159	143	QA	SOIL	08/11/93
P6MW4C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/11/93
P6MW4C SPIKE	59	77	78	87	146	96	140	140	124	QA	SOIL	08/11/93
P6MW5A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	1	SOIL	08/11/93
P6MW5C	4	18	ND	18	38	64	82	44	34	10	SOIL	08/11/93
P6MW5C LAB DUP	5	21	ND	20	44	72	87	41	38	10	SOIL	08/11/93
P6MW5D	6	16	ND	22	40	49	98	44	51	10	SOIL	08/11/93
P6MW5E	ND	43	ND	64	78	122	478	160	875	8	SOIL	08/11/93
P6MW6A	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/14/93
P6MW6AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	WATER	08/11/93
P6MW6B	ND	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/14/93
P6MW6C	ND	ND	ND	ND	ND	ND	ND	ND	ND	14-16	SOIL	08/14/93
P6MW6D	ND	ND	ND	ND	ND	ND	ND	ND	ND	38-40	SOIL	08/14/93
P6MW7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/16/93
P6MW7AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	WATER	08/24/93
P6MW7B	ND	ND	ND	ND	ND	ND	ND	ND	ND	7-9	SOIL	08/16/93
P6MW7C	BM	ND	ND	BMDL	BMDL	ND	ND	ND	ND	14	SOIL	08/16/93
P6MW7D	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	08/16/93
P6MW8A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	SOIL	08/27/93
P6MW8AA	BM	6	24	9	ND	4	23	22	ND	12	WATER	08/29/93
P6MW8AA LABDUP	1	7	24	9	ND	4	20	17	ND	12	WATER	08/29/93
P6MW8AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	WATER	08/27/93
P6MW8AW FIELD DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	WATER	08/27/93
P6MW8B	ND	ND	ND	ND	ND	ND	ND	ND	ND	7-9	SOIL	08/27/93

Analytical Results from On-Site Field GC  
Alpena CRTC, Alpena MI  
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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P6MW8C	60	82	ND*	5724	408	3752	6318	3028	6958	9-11	SOIL	08/27/93
P6MW8D	ND	ND	ND	ND	ND	ND	ND	ND	ND	11-13	SOIL	08/27/93
P6MW8E	2	12	8	12	ND	10	16	ND	ND	13-15	SOIL	08/27/93
P6MW8E LABDUP	2	14	8	14	ND	10	10	ND	ND	13-15	SOIL	08/27/93
P6MW9AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	WATER	08/29/93
P6MW9AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	WATER	08/28/93
P6MW9AW LABDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	WATER	08/28/93
P6TW10A	ND	ND	ND	ND	ND	ND	ND	ND	ND	5-7	SOIL	09/12/93
P6TW10AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	13	WATER	09/12/93
P6TW10B	ND	ND	ND	ND	ND	4	ND	ND	ND	7-9	SOIL	09/12/93
P8MW5A	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	09/12/93
P8SB2A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/13/93
P8SB2B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	5-7	SOIL	08/13/93
P8SB2C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/13/93
P8SB2D	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	11-13	SOIL	08/13/93
P8SB2E	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	56-58	SOIL	08/13/93
P8SB3A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/13/93
P8SB3B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	5-7	SOIL	08/13/93
P8SB3C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/13/93
P8SB4A	ND	BM	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/13/93
P8SB4B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/13/93
P8SB4C	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/13/93
P8SB4D	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/13/93
P8SB5C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/13/93
P8SB6B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P8SB6C	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/15/93
P8SB6D	ND	ND	ND	ND	ND	ND	ND	ND	ND	12-14	SOIL	08/15/93
P8SB7B	ND	BM	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P8SB7C	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/15/93
P8SB7D	ND	ND	ND	ND	ND	ND	ND	ND	ND	12-14	SOIL	08/15/93
P8SB8A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/17/93
P8SB8B LAB DUF	ND	ND	ND	ND	ND	ND	ND	ND	ND	5-7	SOIL	08/17/93

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# Analytical Results from On-Site Field GC

Alpena CRTC, Alpena MI

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SAMPLE ID	t-1,2-DCE c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P8SB8C	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/17/93
P8SB8D	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	08/17/93
P9MW4BB	ND	ND	ND	ND	6	ND	ND	ND	20	WATER	09/12/93
P9MW5BB	ND	ND	ND	ND	ND	ND	ND	ND	21	WATER	09/12/93
P9MW6A	ND	ND	ND	ND	ND	ND	ND	ND	3-5	SOIL	08/31/93
P9MW6B	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/31/93
P9MW6C	ND	ND	ND	ND	4	ND	ND	ND	13-15	SOIL	08/31/93
P9SB13A	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/29/93
P9SB13B	ND	ND	ND	ND	ND	ND	ND	ND	14-16	SOIL	08/29/93
P9SB13C	ND	ND	ND	ND	ND	ND	ND	ND	56-58	SOIL	08/29/93
P9TW7AW	ND	101	22	95	24	ND	1068	881	21	WATER	09/10/93
P9TW7BW	4	16	2	BMDL	1	ND	19	11	31	WATER	09/10/93
P9TW7BW LABDUP.	4	18	2	BMDL	1	ND	18	10	31	WATER	09/10/93
P9TW8AW	3	ND	ND	BMDL	ND	ND	ND	ND	9	WATER	09/12/93
P9TW8AW LABDUP.	ND	ND	ND	BMDL	ND	ND	ND	ND	9	WATER	09/12/93
RT9MW6AA	ND	907	536	3770	298	ND	10920	6910	19	WATER	08/31/93
DECONH20	ND	ND	ND	ND	ND	ND	ND	ND	0	SOIL	08/11/93
PBG1A	ND	ND	BMDL	ND	ND	ND	ND	ND	0-2	SOIL	08/10/93
PBG1B	ND	ND	BMDL	ND	ND	ND	ND	ND	2-4	SOIL	08/10/93
PBG1C	ND	ND	BMDL	ND	ND	ND	ND	ND	4-6	SOIL	08/10/93
PBG1D	ND	ND	BMDL	ND	ND	ND	ND	ND	8-10	SOIL	08/10/93
PBG2A	ND	ND	ND	ND	BMDL	ND	ND	ND	0-2	SOIL	08/15/93
PBG2B	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/15/93
PERA	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/11/93
PERAA	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/29/93
PERAB	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/29/93
PERAC	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/30/93
PERAD	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/31/93
PERB	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/16/93
PERB	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/16/93
PERBB	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	09/10/93

Analytical Results from On-Site Field GC  
 Alpena CRTC, Alpena MI  
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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
PERC	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/17/93
PERD	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/25/93
PERE	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/26/93



**Appendix F: Surface Water and Sediment  
Sampling Forms**



# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG

Project Number 931800-12

Location Sinkhole, Southwest of Site 4

Sample Number P04W001(E)

Site 4 - surface drainage at seep on south side

Duplicate Number       

Recorded By PH Lay

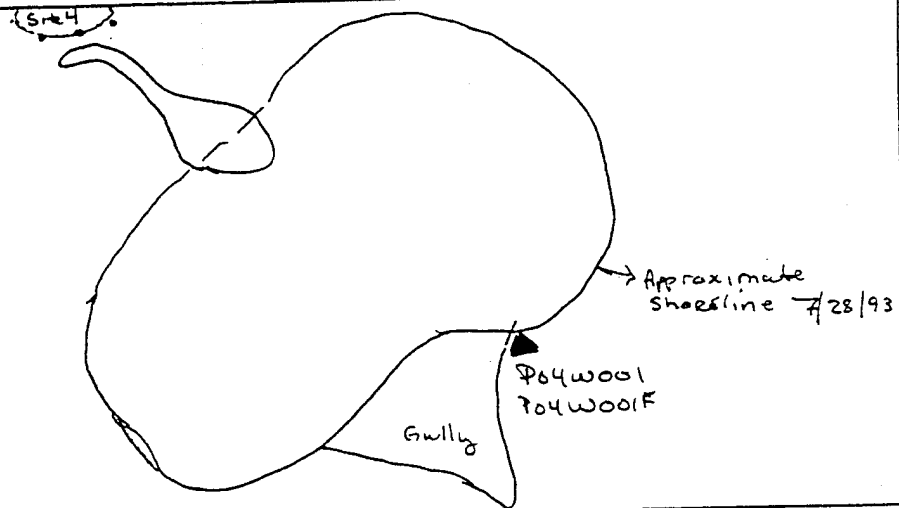
Date 7/28/93

Checked By       

Date       

Sampling Point Location (sketch)

← North



\*not to scale

## Water Parameters

Before Sampling: pH        EC        Temperature       

After Sampling: pH 7.6 EC 298  $\mu$ ms Temperature 60.2°F

## Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCL, 4°C	4 x 40mL glass	P04W001
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W001
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W001
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W001
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W001F

# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage -  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W002 (F)  
 Duplicate Number \_\_\_\_\_  
 Date 7/28/93  
 Date \_\_\_\_\_

## Sampling Point Location (sketch)

← North

(Site 4)

▲ P04W002  
P04W002F

→ Approximate  
Shoreline 7/28/93

Gully

\*not to scale

## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 7.44 EC 273 us/cm Temperature 60.1°F

## Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCS	Surface		HCL, 4°C	4 x 40mL glass	P04W002
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W002
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W002
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W002
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W002

# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage - SE part of Sinkhole  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W003(F)  
 Duplicate Number \_\_\_\_\_  
 Date 7/28/93  
 Date \_\_\_\_\_

## Sampling Point Location (sketch)

← North

(Site 4)

▲ P04W003  
P04W003F

→ Approximate  
Shoreline 7/28/93

Gully

\*not to scale

## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 7.42 EC 285  $\mu$ S/cm Temperature 65.3°F

## Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCL, 4°C	4 x 40mL glass	P04W003
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W003
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W003
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W003
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W003F

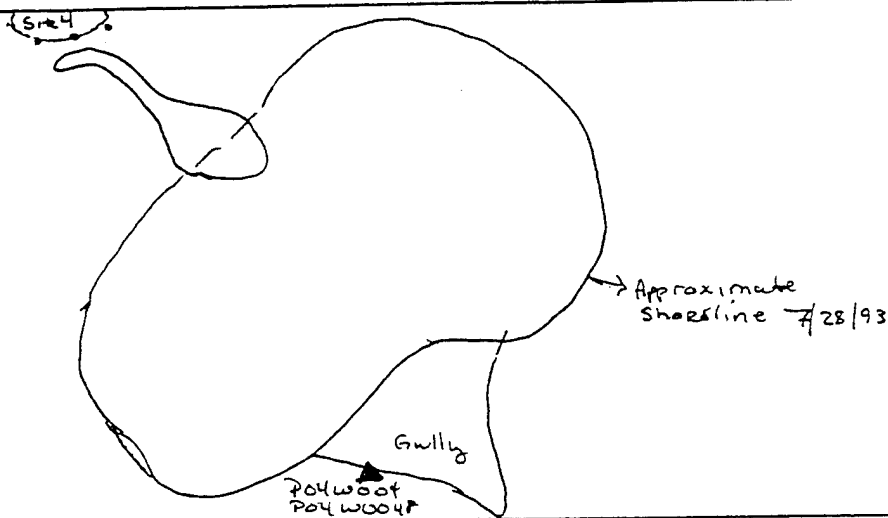
# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage - seep SW of Site 4  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W004(F)  
 Duplicate Number \_\_\_\_\_  
 Date 7/28/93  
 Date \_\_\_\_\_

Sampling Point Location (sketch)

← North



not to scale

## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 7.43 EC 303  $\mu$ S/cm Temperature 62.6 °F

## Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCL, 4°C	4 x 40mL glass	P04W004
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W004
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W004
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W004
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W004F

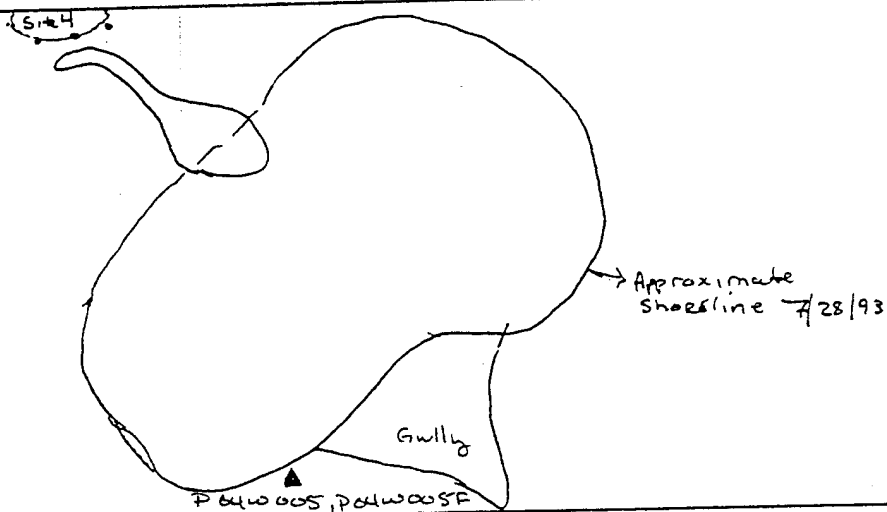
# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W005 (F)  
 Duplicate Number —  
 Date 7/30/93  
 Date \_\_\_\_\_

## Sampling Point Location (sketch)

← North



## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 8.05 EC 291  $\mu$ S/cm Temperature 58°F

## Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCl, 4°C	4 x 40mL glass	P04W005
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W005
TPH	Surface		HCl, 4°C	1 x 1 Liter glass	P04W005
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W005
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W005F

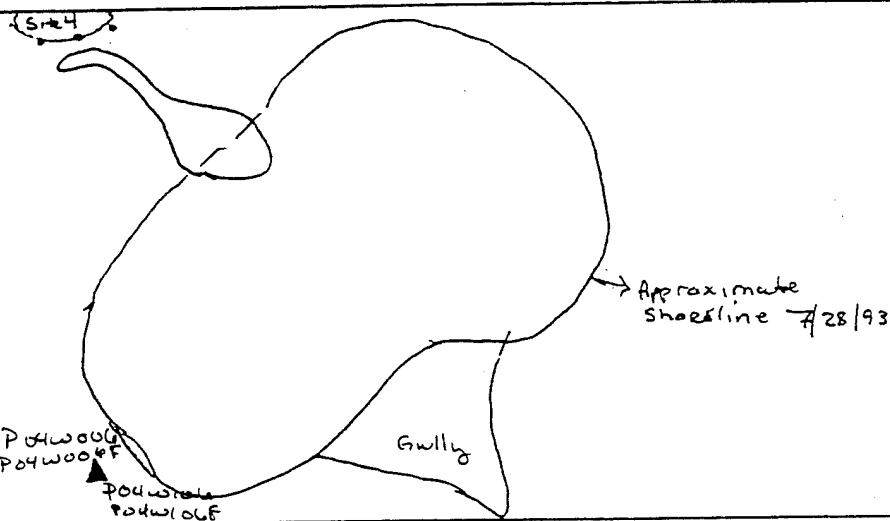
# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W006(F)  
 Duplicate Number P04W106(F)  
 Date 7/30/93  
 Date \_\_\_\_\_

Sampling Point Location (sketch)

← North



\*not to scale

## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 7.87 EC 406  $\mu$ S/cm Temperature 57.8°F

## Sampling Information

Analytical Parameter	Sampling Depth	√ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCL, 4°C	4 x 40mL glass	P04W006
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W006
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W006
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W006
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W006F
VOCs	Surface		HCL, 4°C	4 x 40mL glass	P04W106
SVOCs	Surface		4°C	2 x 1 Liter glass	P04W106
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W106
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W106
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W106F

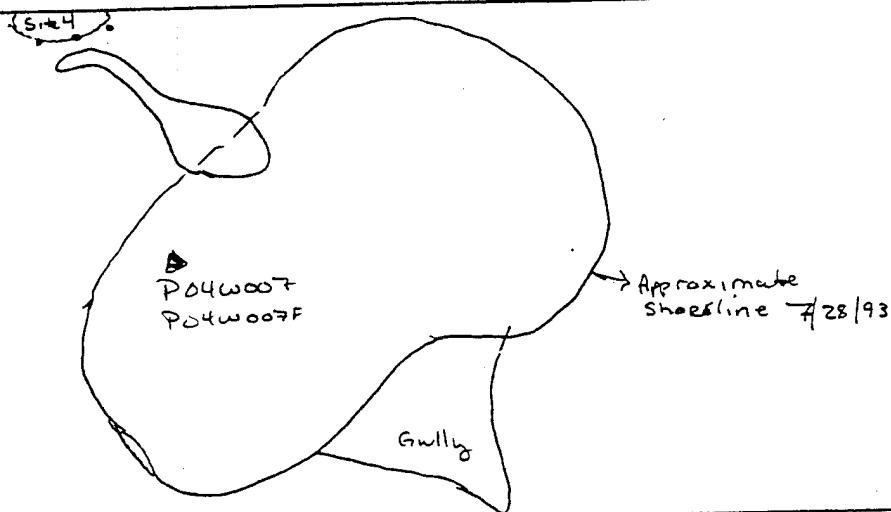
# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W007 (F)  
 Duplicate Number -  
 Date 7/30/93  
 Date \_\_\_\_\_

## Sampling Point Location (sketch)

← North



\*not to scale

## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 7.33 EC 336  $\mu$ S/cm Temperature 78.7 °F

## Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	surface		HCl, 4°C	4 x 40mL glass	P04W007
SVOCs	surface		, 4°C	2 x 1 Liter glass	P04W007
TPH	surface		HCl, 4°C	1 x 1 Liter glass	P04W007
PP metals	surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W007
PP metals	surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W007F

# Surface Water Sampling Record

Project Name <u>Alpena CRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, southwest of Site 4</u>	Sample Number <u>P04W008 (F)</u>
Site <u>4 - surface drainage</u>	Duplicate Number <u>—</u>
Recorded By <u>PH Lay</u>	Date <u>7/30/93</u>
Checked By <u>—</u>	Date <u>—</u>

Sampling Point Location (sketch)

North

P04W008

Approximate shoreline 7/28/93

Gully

not to scale

Water Parameters

Before Sampling: pH <u>—</u>	EC <u>—</u>	Temperature <u>—</u>
After Sampling: pH <u>7.78</u>	EC <u>314 <math>\mu</math>S/cm</u>	Temperature <u>76.9°F</u>

Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCl, 4°C	4 x 40mL glass	P04W008
SVOCs	Surface		4°C	2 x 1 Liter glass	P04W008
TPH	Surface		HCl, 4°C	1 x 1 Liter glass	P04W008
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W008
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W008F

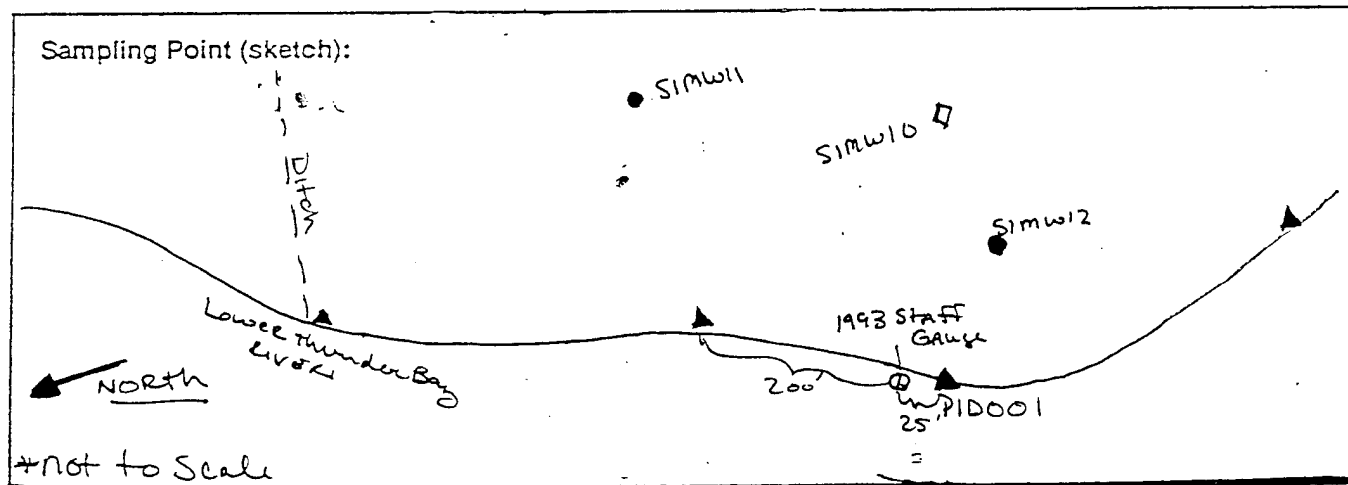
## **Sediment Sampling Forms**



## Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIANG</u>	Project Number <u>931500-12</u>
Location <u>Phelps Collon ANG SW side of Base</u>	Sample Number <u>P1D001</u>
Recorded By <u>P#Lg</u>	Duplicate Number <u>—</u>
Date <u>9/13/93</u>	Checked By <u>—</u>
Site <u>1-POL Storage area</u>	Date <u>—</u>

Sampling Equipment <u>HAND Auger, Stainless Steel Spools, auger handle w/ extensions</u>		
Sample Type <u>Soil</u>	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Sediment</span>	Rock
Sample Type Description		
USCS Soil Type <u>Sp w/ organics</u>		
Color <u>none</u>		
Odor <u>Drk Brown</u>		
Depth <u>0-1'</u>		
Number of Samples <u>1</u>		
Comments <u>1</u>		



Decontamination		Decontamination Fluids: <u>—</u>	
Equipment: <input checked="" type="checkbox"/> Hand auger		<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
Type <u>AMS</u>		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
<input type="checkbox"/> Other <u>—</u>		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC MTRNG</u>	Project Number <u>931800-12</u>
Location <u>Phelpsding ANG SW Part of Bas</u>	Sample Number <u>P1D002</u>
Recorded By <u>PLA</u>	Duplicate Number <u>P1D004</u>
Date <u>8 9/13/93</u>	Checked By _____
Site <u>1-POL Storage area</u>	Date _____

Sampling Equipment HAND Auger, Stainless Steel Spools, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp

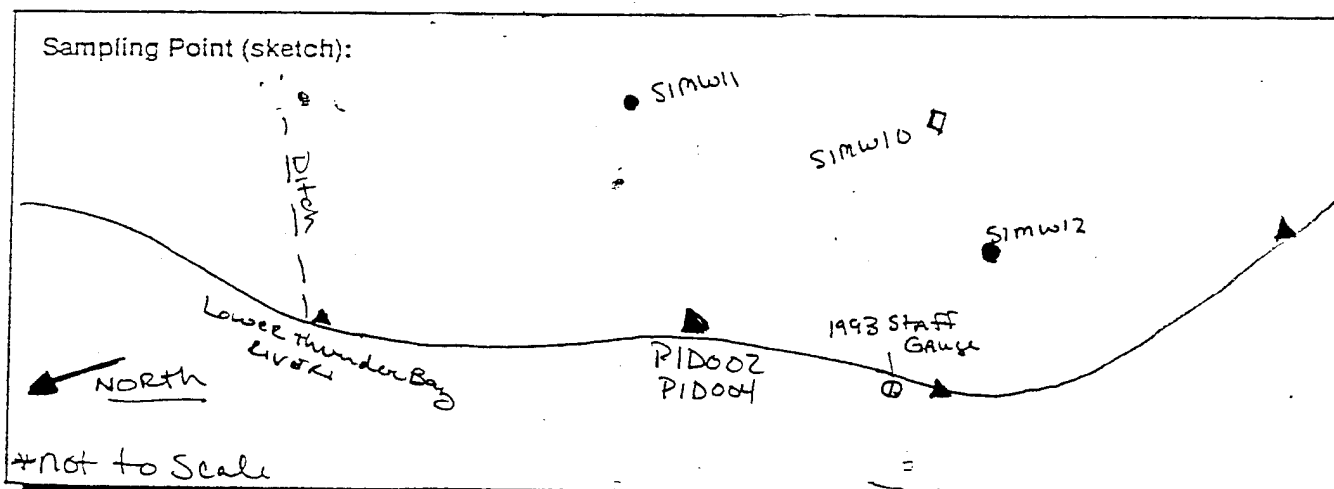
Color Dark Brown - Brown

Odor none

Depth 0-1'

Number of Samples 2

Comments \_\_\_\_\_



Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC MIAWG</u>	Project Number <u>931500-12</u>
Location <u>Phelps Collins ANG - SW Port of Base</u>	Sample Number <u>PID003</u>
Recorded By <u>J. L. G.</u>	Duplicate Number <u>      </u>
Date <u>9/13/93</u>	Checked By <u>      </u>
Site <u>1 - POL Storage Area</u>	Date <u>      </u>

Sampling Equipment HAND AUGER, STAINLESS STEEL SPEARS, AUGER HANDLE w/ EXTENSIONS

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP

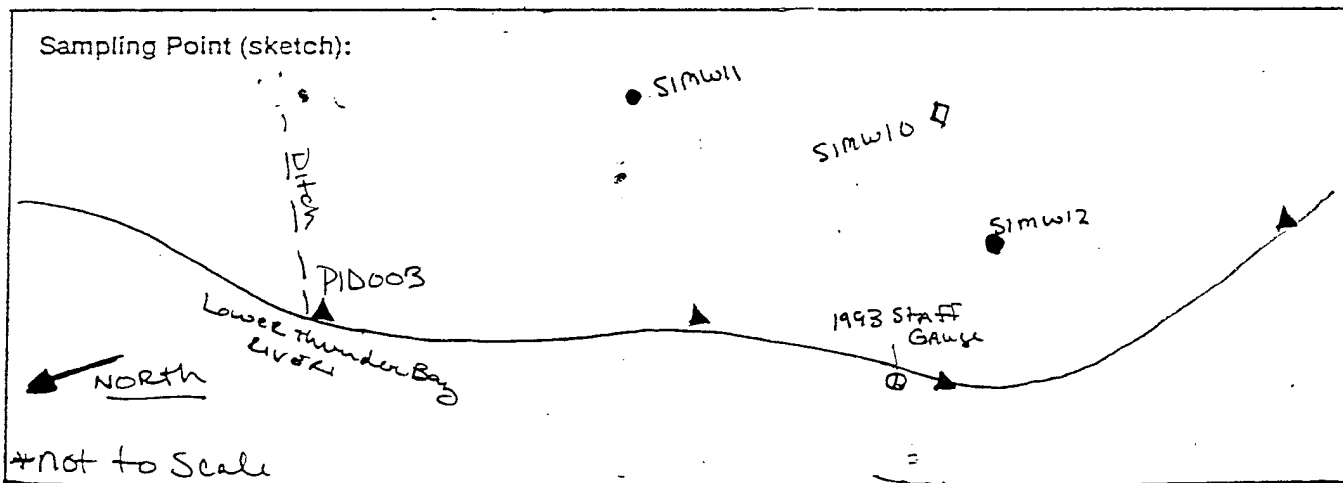
Color Dark Brown

Odor none

Depth 0-1'

Number of Samples 1

Comments       



Decontamination		Decontamination Fluids: <u>      </u>	
Equipment: <input checked="" type="checkbox"/> Hand auger		<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
Type <u>AMS</u>		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
<input type="checkbox"/> Other <u>      </u>		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>      </u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAUG</u>	Project Number <u>931800-12</u>
Location <u>Phelps Collins ANG. Surface of Base</u>	Sample Number <u>P1D005</u>
Recorded By <u>JH Lay</u>	Duplicate Number <u>      </u>
Date <u>9/13/93</u>	Checked By <u>      </u>
Site <u>1- POL Storage area</u>	Date <u>      </u>

Sampling Equipment Hand Auger, Stainless Steel Spools, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp

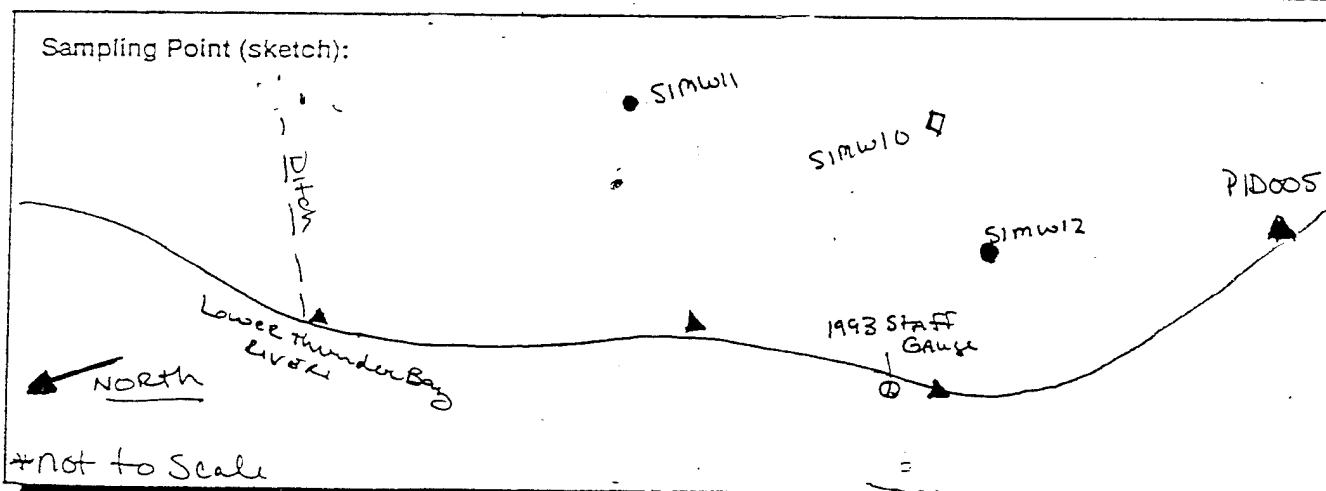
Color Dark Brown

Odor None

Depth 0-1'

Number of Samples 1

Comments       



Decontamination		Decontamination Fluids:	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>      </u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>      </u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRIC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P01DD01A</u>
Recorded By <u>P. Lag</u>	Duplicate Number <u>—</u>
Date <u>7/29/93</u>	Checked By <u>7</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND Auger, Stainless Steel spoons, auger handle w/ extensions</u>
Sample Type                      Soil <u>Sediment</u> Rock
Sample Type Description
USCS Soil Type <u>Sp w/ organics - sticks, leaves</u>
Color <u>Brown</u>
Odor <u>none</u>
Depth <u>0-1'</u>
Number of Samples <u>1</u>
Comments <u>staken at mouth of seep</u> <u>P01</u> <u>7/29/93</u>

Sampling Point (sketch):

\*not to scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>—</u>
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>—</u>	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D001</u>
Recorded By <u>P. Lay</u>	Duplicate Number <u>      </u>
Date <u>7/29/93</u>	Checked By <u>      </u>
Site <u>4 drawing of surface water</u>	Date <u>      </u>

Sampling Equipment <u>Hand Auger, Stainless Steel Spoons, auger handle w/ extensions</u>
Sample Type                      Soil <u>Sediment</u> Rock
Sample Type Description
USCS Soil Type <u>SP w/ organic materials</u>
Color <u>Lt Brown to Brown</u>
Odor <u>none</u>
Depth <u>0-1'</u>
Number of Samples <u>1</u>
Comments <u>Sample collected 25' down from mouth of seep, P04W001, P04D001A</u>

Sampling Point (sketch):

← North

Approximate Shoreline 7/28/93

P04D001

Gully

not to scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>      </u>
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>      </u>	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other <u>      </u>

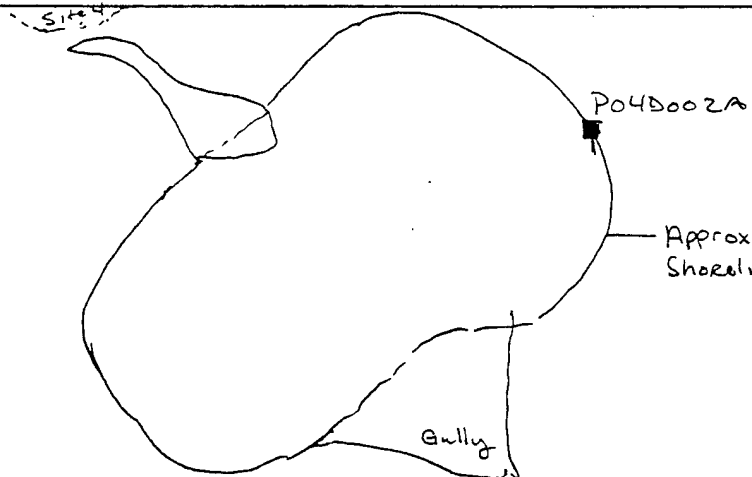
## Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D002A</u>
Recorded By <u>JAL</u>	Duplicate Number _____
Date <u>7/29/93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment <u>HAND Auger, Stainless Steel Spools, auger handle w/ extensions</u>	
Sample Type	Soil <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Sediment</span> Rock
Sample Type Description	
USCS Soil Type <u>Sp w/ organic rich (sticks, leaves, grass)</u>	
Color <u>dk brown - brown</u>	
Odor <u>none</u>	
Depth <u>0-1'</u>	
Number of Samples <u>1</u>	
Comments <u>Sample collected</u>	

Sampling Point (sketch):

← North



\*Not to Scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger Type <u>AMS</u> <input type="checkbox"/> Trowel <input type="checkbox"/> Other _____	Decontamination Fluids: _____ <input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol <input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane <input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> ; dilution <input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MICH</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D002B</u>
Recorded By <u>JAL</u>	Duplicate Number <u>—</u>
Date <u>7/29/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment Hand Auger, Stainless Steel Spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp w/ organics

Color Brown

Odor None

Depth 0-1'

Number of Samples 1

Comments taken at Potw002, north of seep being.

Sampling Point (sketch):

North

P04D002B

Approximate Shoreline 7/28/93

Gully

Not to Scale

Decontamination		Decontamination Fluids:	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTIC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u><del>P04</del> P04D003</u>
Recorded By <u>PALag</u>	Duplicate Number <u>7</u>
Date <u>7-29-93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment <u>HAND Auger, Stainless Steel Spoons, auger handle w/ extensions</u>
Sample Type                      Soil <u>Sediment</u> Rock
Sample Type Description
USCS Soil Type <u>Sp w/organics</u>
Color <u>Brn - Dk Brn</u>
Odor <u>None</u>
Depth <u>0-1'</u>
Number of Samples _____
Comments <u>at location P04D003</u>

Sampling Point (sketch):

\*Not to Scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: _____
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D004A</u>
Recorded By <u>PALay</u>	Duplicate Number <u>      </u>
Date <u>7/30/93</u>	Checked By <u>      </u>
Site <u>4 drawing of surface water</u>	Date <u>      </u>

Sampling Equipment Hand Auger, Stainless Steel spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp

Color Lt Brown

Odor None

Depth 0-1'

Number of Samples 1

Comments collected down from seep at P04D004B  
and P04W004(F)

Sampling Point (sketch):

\*Not to Scale

Decontamination		Decontamination Fluids: <u>      </u>	
Equipment: <input checked="" type="checkbox"/> Hand auger		<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
Type <u>      </u>		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
<input type="checkbox"/> Other <u>      </u>		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>      </u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRIC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D004B</u>
Recorded By <u>PLA</u>	Duplicate Number <u>P04D104B</u>
Date <u>7-30-93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment <u>HAND Auger, Stainless Steel Spoons, auger handle w/ extensions</u>
Sample Type                      Soil <u>Sediment</u> Rock
Sample Type Description
USCS Soil Type <u>SP w/ organics</u>
Color <u>Bm-Lt Bm</u>
Odor <u>none</u>
Depth <u>0-1'</u>
Number of Samples <u>2</u>
Comments <u>at deep mouth p04 w004</u>

Sampling Point (sketch):

North

Approximate Shoreline 7/28/93

P04D004B Gully

Not to Scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: _____
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D005A</u>
Recorded By <u>P. L. L.</u>	Duplicate Number <u>—</u>
Date <u>7/30/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment HAND Auger, Stainless Steel Spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP w/some organics

Color Lt Brown

Odor none

Depth 0-1'

Number of Samples 1

Comments taken down from P04D005B, P04W005

Sampling Point (sketch):

← North

\*Not to Scale

Decontamination		Decontamination Fluids: <u>—</u>	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>—</u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTIC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D0053</u>
Recorded By <u>PALay</u>	Duplicate Number <u>—</u>
Date <u>7/30/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND Auger, Stainless Steel Spoons, auger handle w/ extensions</u>	
Sample Type	Soil <input type="checkbox"/> <u>Sediment</u> <input checked="" type="checkbox"/> Rock <input type="checkbox"/>
Sample Type Description	
USCS Soil Type <u>Sp w/organics</u>	
Color <u>Lt Brwn - Brown</u>	
Odor <u>none</u>	
Depth <u>0-1'</u>	
Number of Samples <u>1</u>	
Comments <u>taken at mouth of seep P04W005</u>	

Sampling Point (sketch):

\*not to scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>—</u>
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water
<input type="checkbox"/> Other <u>—</u>	<input checked="" type="checkbox"/> Potable Water
	<input checked="" type="checkbox"/> Deionized Water
	<input checked="" type="checkbox"/> Methanol
	<input type="checkbox"/> Hexane
	<input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D006A</u>
Recorded By <u>PAL</u>	Duplicate Number <u>-</u>
Date <u>7/30/93</u>	Checked By <u>-</u>
Site <u>4 drawing of surface water</u>	Date <u>-</u>

Sampling Equipment HAND AUGER, STAINLESS STEEL SPOONS, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP w/pebbles

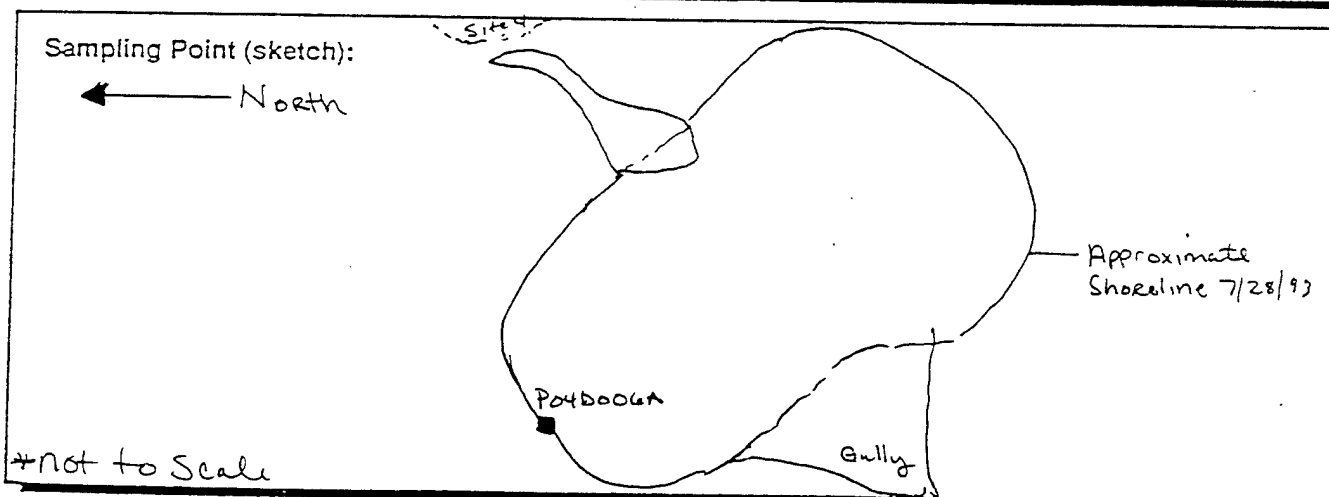
Color Brown

Odor "rotten egg" small > sulfur

Depth 0-1'

Number of Samples 1

Comments taken down from P04D006B, P04W006



Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: _____
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931500-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D006B</u>
Recorded By <u>PALay</u>	Duplicate Number <u>P04D106B</u>
Date <u>7/30/93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment HAND AUGER, STAINLESS STEEL SPEARS, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp. w/ organic

Color Brown

Odor Slight Sulfide odor - "rotten eggs"

Depth 0.1'

Number of Samples 2

Comments taken at mouth of seep P04D006B.

Sampling Point (sketch):

\*not to scale

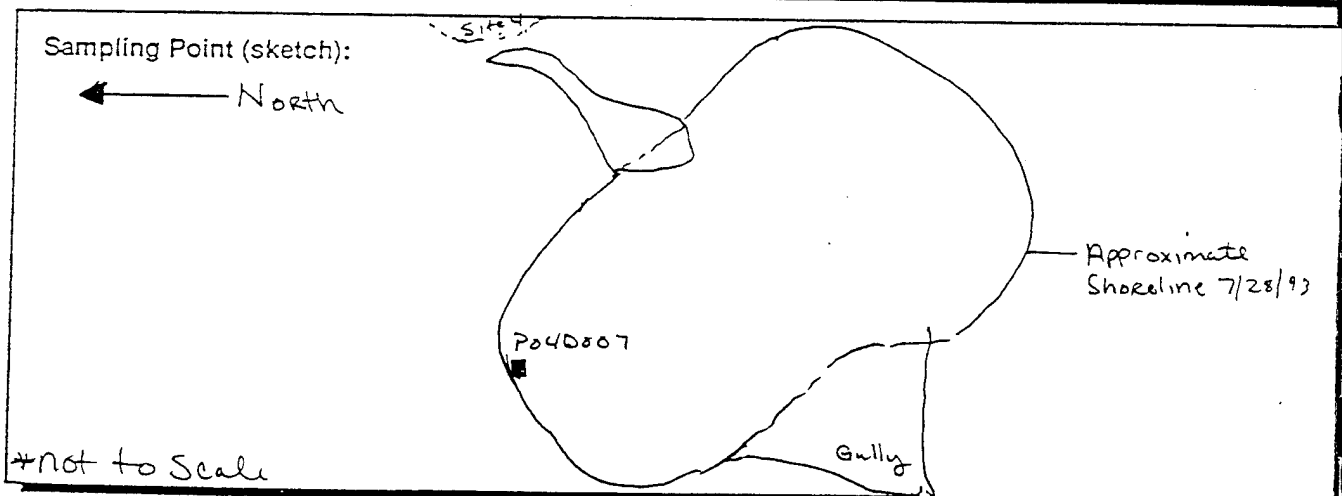
Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

Form F1025

## Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MICHIGAN</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P040007</u>
Recorded By <u>J. H. Lay</u>	Duplicate Number <u>—</u>
Date <u>7/3/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND AUGER, STAINLESS STEEL SPOONS, auger handle w/ extensions</u>	
Sample Type	<div style="display: flex; justify-content: space-around;"> <span>Soil</span> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Sediment</span> <span>Rock</span> </div>
Sample Type Description	
USCS Soil Type <u>Sp</u>	
Color <u>Light Brown to Brown</u>	
Odor <u>none</u>	
Depth <u>0-1'</u>	
Number of Samples <u>1</u>	
Comments <u>taken at a sand Boil assoc. w/ seep.</u>	



Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger Type <u>AMS</u> <input type="checkbox"/> Trowel <input type="checkbox"/> Other <u>—</u>	Decontamination Fluids: <u>—</u> <input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol <input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane <input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> ; dilution <input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MICHIGAN</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D008</u>
Recorded By <u>P. L. L.</u>	Duplicate Number <u>—</u>
Date <u>7/31/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND AUGER, STAINLESS STEEL SPOONS, auger handle w/ extensions</u>	
Sample Type	<input type="checkbox"/> Soil <input checked="" type="checkbox"/> <u>Sediment</u> <input type="checkbox"/> Rock
Sample Type Description	
USCS Soil Type <u>Sp</u>	
Color <u>lt. Brown</u>	
Odor <u>none</u>	
Depth <u>0-1'</u>	
Number of Samples <u>1</u>	
Comments <u>—</u>	

Sampling Point (sketch):

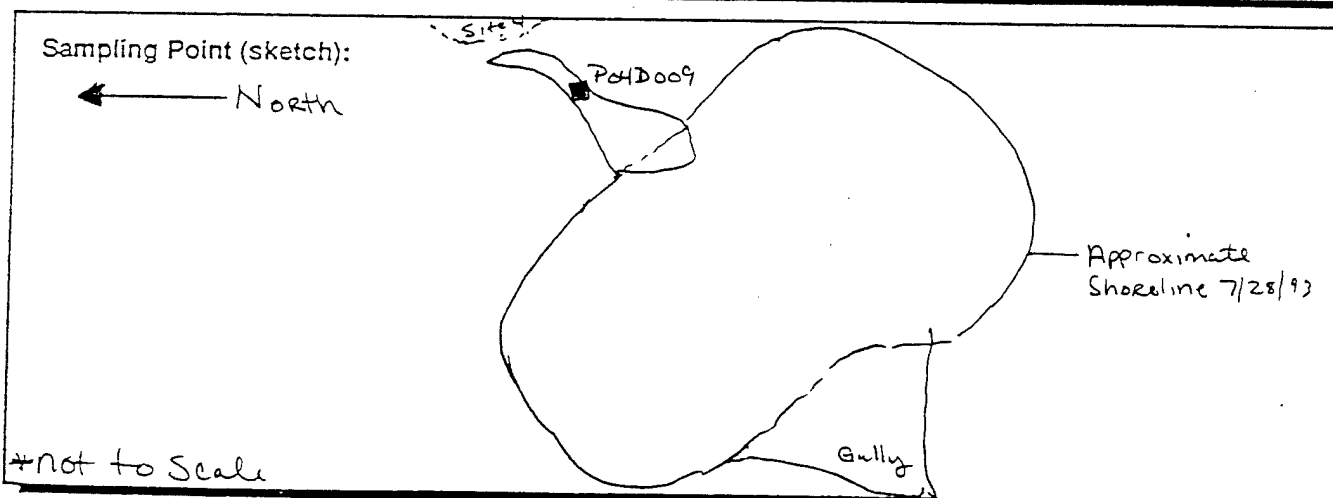
\*not to scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>—</u>
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water
<input type="checkbox"/> Other <u>—</u>	<input checked="" type="checkbox"/> Potable Water
	<input checked="" type="checkbox"/> Deionized Water
	<input checked="" type="checkbox"/> Methanol
	<input type="checkbox"/> Hexane
	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
	<input type="checkbox"/> Other <u>—</u>

## Soil/Sediment Sampling Record

Project Name <u>Alpena CRIC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D009</u>
Recorded By <u>P. Lag</u>	Duplicate Number _____
Date <u>7/31/93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment <u>HAND Auger, Stainless Steel Spools, auger handle w/ extensions</u>	
Sample Type	Soil <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Sediment</span> Rock
Sample Type Description	
USCS Soil Type <u>SP</u>	
Color <u>Lt. Brown - Brown</u>	
Odor <u>none</u>	
Depth <u>0-1' - A sample, ~3' B sample</u>	
Number of Samples <u>2</u>	
Comments <u>P04D009A collected at 0-1' and P04D009B collected @ 3'</u>	



Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger Type <u>AMS</u> <input type="checkbox"/> Trowel <input type="checkbox"/> Other _____	Decontamination Fluids: _____ <input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol <input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane <input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> : dilution <input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MTLANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D010 (and B)</u>
Recorded By <u>P. Lag</u>	Duplicate Number <u>      </u>
Date <u>7/31/93</u>	Checked By <u>      </u>
Site <u>4 drawing of surface water</u>	Date <u>      </u>

Sampling Equipment <u>HAND Auger, Stainless Steel Spools, auger handle w/ extensions</u>	
Sample Type	Soil <u>Sediment</u> Rock
Sample Type Description	<u>0-1'</u> <u>3.5-4'</u>
USCS Soil Type	<u>SP</u> <u>SP</u>
Color	<u>Lt Brown - Brown</u> <u>Gray Brown</u>
Odor	<u>none</u> <u>none</u>
Depth	<u>0-1'</u> <u>3.5-4'</u>
Number of Samples	<u>1</u> <u>1</u>
Comments	<u>P04D010A</u> <u>P04D010B</u>

Sampling Point (sketch):

\*Not to Scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>      </u>
Type <u>      </u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>      </u>	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other <u>      </u>

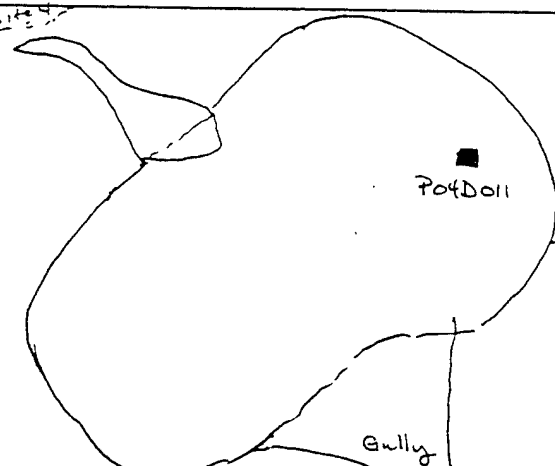
## Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D011</u>
Recorded By <u>P. Lay</u>	Duplicate Number <u>-</u>
Date <u>8/1/93</u>	Checked By <u>-</u>
Site <u>4 drawing of surface water</u>	Date <u>-</u>

Sampling Equipment <u>Hand Auger, Stainless Steel Spoons, auger handle w/ extensions</u>	
Sample Type	Soil <u>Sediment</u> Rock
Sample Type Description	
USCS Soil Type <u>SP</u>	
Color <u>Gry Brown - Brown</u>	
Odor <u>none</u>	
Depth <u>in @ 5' of water 1' from bottom sed</u>	
Number of Samples <u>1</u>	
Comments _____	

Sampling Point (sketch):

← North



\*Not to Scale

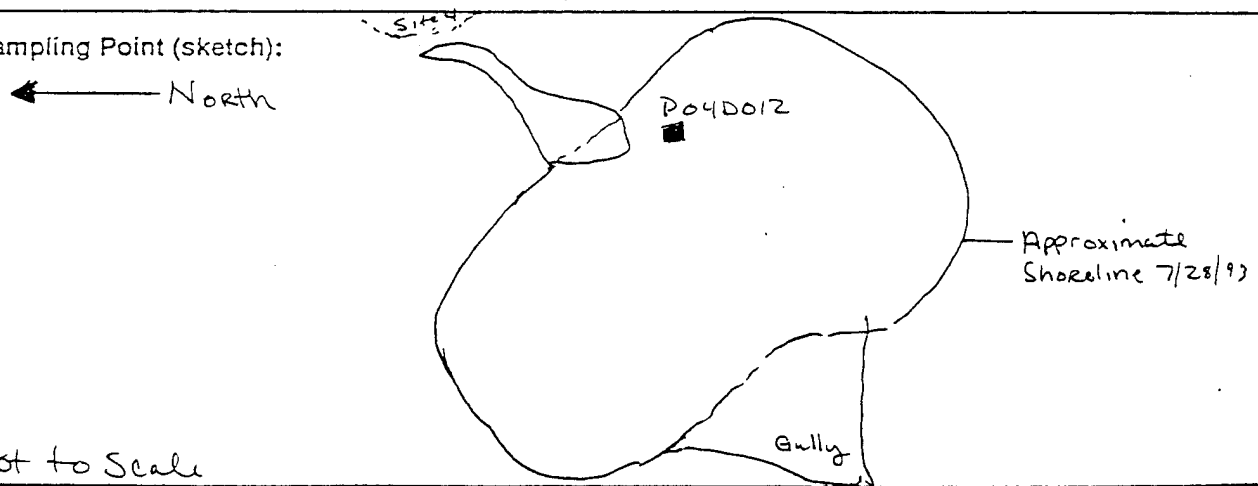
Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger Type <u>AMS</u> <input type="checkbox"/> Trowel <input type="checkbox"/> Other _____	Decontamination Fluids: _____ <input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol <input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane <input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> ; dilution <input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other _____

## Soil/Sediment Sampling Record

Project Name <u>Alpena CRIC, MIAUG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D012</u>
Recorded By <u>P. Lay</u>	Duplicate Number <u>—</u>
Date <u>8/1/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND Auger, STAINLESS Steel SPOONS, auger handle w/ extensions</u>			
Sample Type	Soil	<u>Sediment</u>	Rock
Sample Type Description			
USCS Soil Type <u>Sp</u>			
Color <u>Grey Brown/Drum</u>			
Odor <u>None</u>			
Depth <u>~5' of water 1' of Bottom sed</u>			
Number of Samples <u>1</u>			
Comments <u>—</u>			

Sampling Point (sketch):



← North

Approximate Shoreline 7/28/93

Gully

\*Not to Scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger Type <u>—</u> <input type="checkbox"/> Trowel <input type="checkbox"/> Other <u>—</u>	Decontamination Fluids: <u>—</u> <input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol <input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane <input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> ; dilution <input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIAWA</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D013</u>
Recorded By <u>PAL</u>	Duplicate Number <u>—</u>
Date <u>8/1/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment HAND AUGER, STAINLESS STEEL SPOONS, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP

Color Brown

Odor none

Depth at bottom of sinkhole ~1' of sed.

Number of Samples 1

Comments —

Sampling Point (sketch):

← North

\*not to scale

Decontamination		Decontamination Fluids: <u>—</u>	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>—</u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D014</u>
Recorded By <u>PALay</u>	Duplicate Number <u>—</u>
Date <u>8/1/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND Auger, Stainless Steel spoons, auger handle w/ extensions</u>	
Sample Type	Soil <input type="radio"/> <u>Sediment</u> <input checked="" type="radio"/> Rock <input type="radio"/>
Sample Type Description	
USCS Soil Type <u>Sp</u>	
Color <u>Brown</u>	
Odor <u>none</u>	
Depth <u>1' of sediment</u>	
Number of Samples <u>1</u>	
Comments <u>—</u>	

Sampling Point (sketch):

\*not to scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>—</u>
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water
<input type="checkbox"/> Other <u>—</u>	<input checked="" type="checkbox"/> Potable Water
	<input checked="" type="checkbox"/> Deionized Water
	<input checked="" type="checkbox"/> Methanol
	<input type="checkbox"/> Hexane
	<input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D015</u>
Recorded By <u>PAL</u>	Duplicate Number <u>P04D115</u>
Date <u>8/1/93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment HAND AUGER, STAINLESS STEEL SPEEDS, AUGER HANDLE w/ EXTENSIONS

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp w/ organics

Color Brown

Odor \_\_\_\_\_

Depth water depth ~ 3.5' - 1' of sediment

Number of Samples 2

Comments \_\_\_\_\_

Sampling Point (sketch):

← North

not to scale

Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D016</u>
Recorded By <u>P. Lay</u>	Duplicate Number <u>-</u>
Date <u>8/1/93</u>	Checked By <u>-</u>
Site <u>4 drawing of surface water</u>	Date <u>-</u>

Sampling Equipment HAND AUGER, STAINLESS STEEL SPOOLS, AUGER HANDLE w/ EXTENSIONS

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp

Color dark gray

Odor strong, Feted odor - sewage-like

Depth 9' of water                      1' of sed.

Number of Samples 1

Comments \_\_\_\_\_

Sampling Point (sketch):

← North

P04D016

Approximate Shoreline 7/28/93

Gully

not to scale

Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol	
Type <u>AMS</u>	<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane	
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution	
<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____	

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D017</u>
Recorded By <u>PAL</u>	Duplicate Number <u>      </u>
Date <u>8/1/93</u>	Checked By <u>      </u>
Site <u>4 drawing of surface water</u>	Date <u>      </u>

Sampling Equipment Hand Auger, Stainless Steel Spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SC SP w/ organics

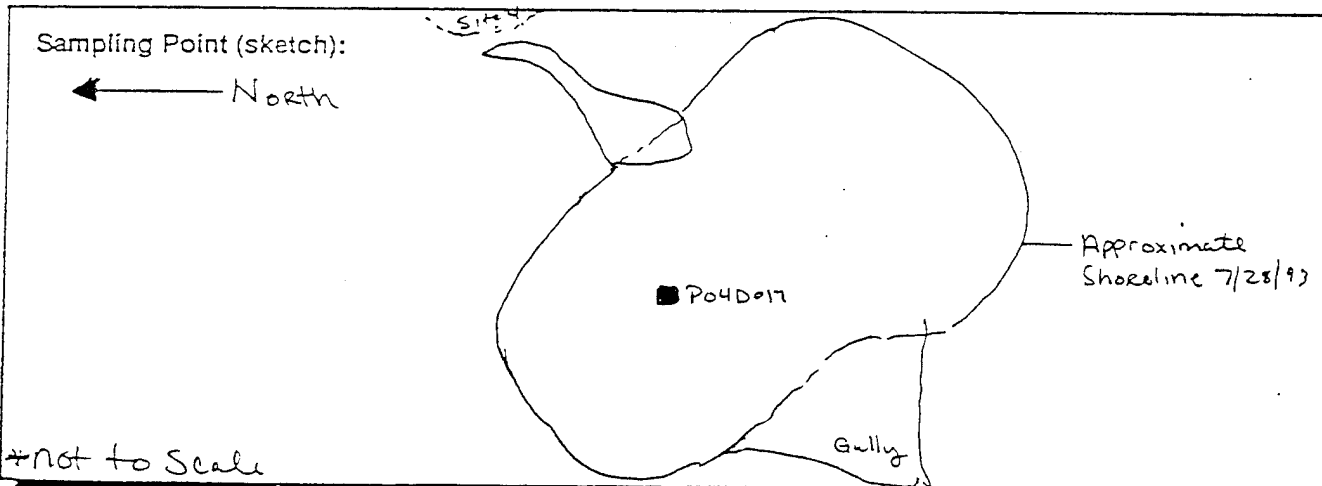
Color Gray-Brown

Odor Fetid odor - sewage smell

Depth 13' of water      2.8' of sed.

Number of Samples 1

Comments       



Decontamination		Decontamination Fluids: <u>      </u>	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>      </u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>      </u>

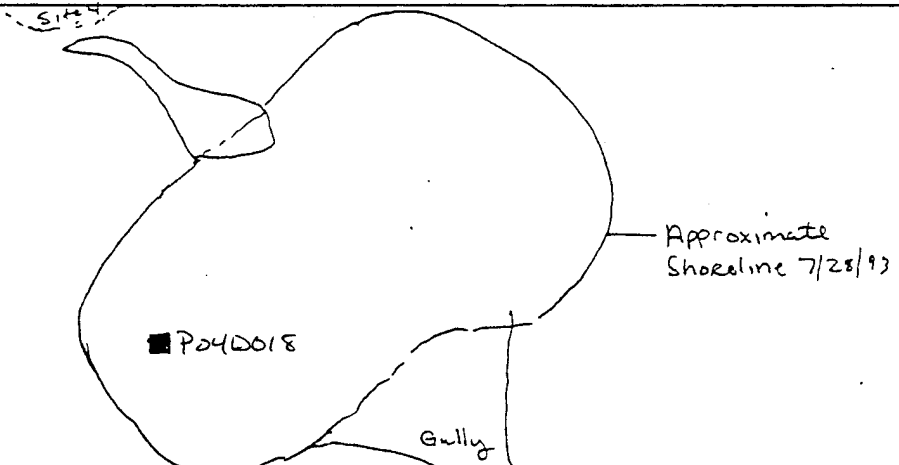
## Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MICHIGAN</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P040018</u>
Recorded By <u>P. L. L.</u>	Duplicate Number <u>      </u>
Date <u>8/1/93</u>	Checked By <u>      </u>
Site <u>4 drawing of surface water</u>	Date <u>      </u>

Sampling Equipment <u>HAND AUGER, STAINLESS STEEL SPOOLS, auger handle w/ extensions</u>			
Sample Type	Soil	<u>Sediment</u>	Rock
Sample Type Description			
USCS Soil Type <u>SC w/ organics</u>			
Color <u>dark grey</u>			
Odor <u>Slight hydrocarbon odor</u>			
Depth <u>19' of water</u>			
Number of Samples <u>1</u>			
Comments <u>      </u>			

Sampling Point (sketch):

← North



\*not to scale

Decontamination		Decontamination Fluids: <u>      </u>	
Equipment: <input checked="" type="checkbox"/> Hand auger		<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
Type <u>AMS</u>		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
<input type="checkbox"/> Other <u>      </u>		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>      </u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC MIANG</u>	Project Number <u>931500-12</u>
Location <u>Phelps Collins ANG - Landfill</u>	Sample Number <u>P06D01</u>
Recorded By <u>PHL</u>	Duplicate Number _____
Date <u>8/17/93</u>	Checked By _____
Site <u>LF 6</u>	Date _____

Sampling Equipment HAND Auger, Stainless Steel Spools, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sand and organic muck

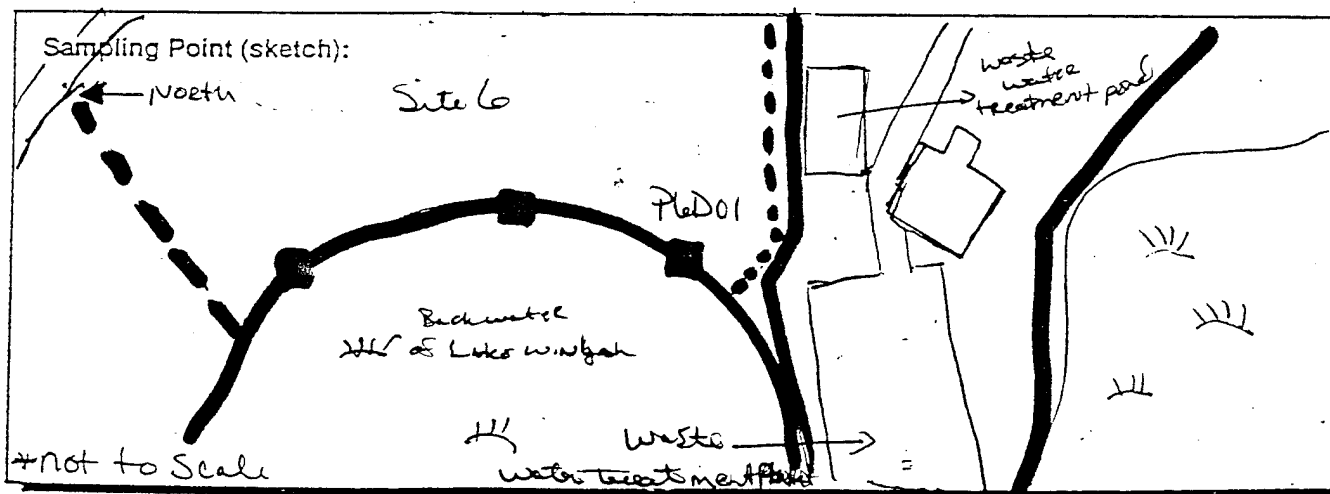
Color Black

Odor Fetid - sewage

Depth 0-1'

Number of Samples 1

Comments \_\_\_\_\_

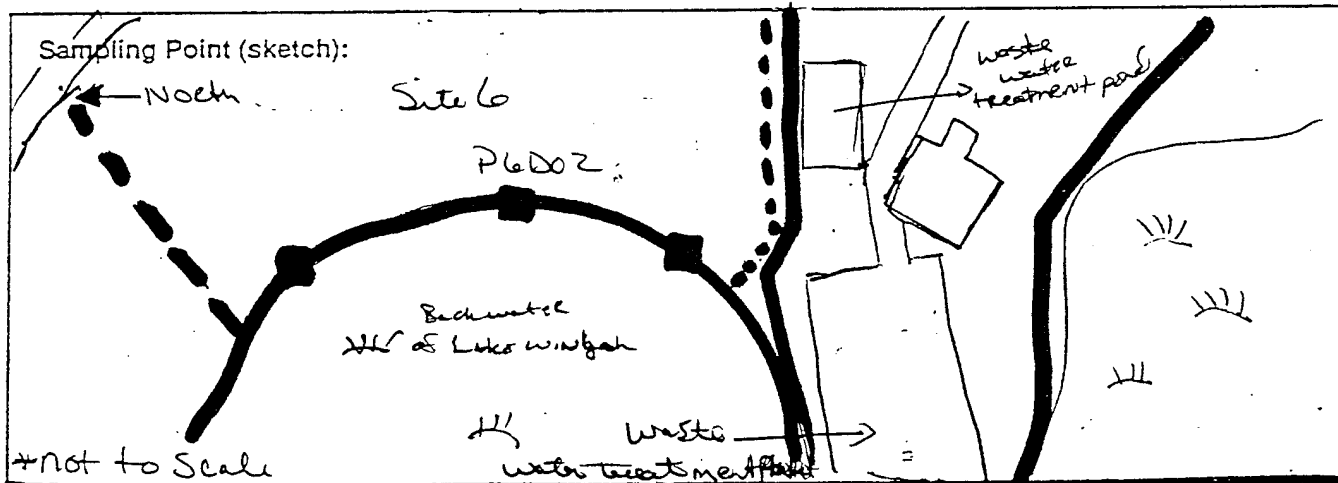


Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: _____
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> ; dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTIC MTRNG</u>	Project Number <u>931800-12</u>
Location <u>Phelps Collins ANG - Landfill</u>	Sample Number <u>P6D02</u> <u>8/17/93</u>
Recorded By <u>PH Lay</u>	Duplicate Number _____
Date <u>8/17/93</u>	Checked By _____
Site <u>LF 6</u>	Date _____

Sampling Equipment <u>HAND Auger, Stainless Steel Spools, auger handle w/ extensions</u>
Sample Type      Soil <u>Sediment</u> Rock
Sample Type Description
USCS Soil Type <u>SC w/ asphalt and other fill material</u>
Color <u>Blk</u>
Odor <u>Sated</u>
Depth <u>0-1'</u>
Number of Samples <u>1</u>
Comments _____



Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: _____
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> ; dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIA NG</u>	Project Number <u>931800-12</u>
Location <u>Phelps Collins ANG - Land fill</u>	Sample Number <u>P6D03</u>
Recorded By <u>P+Lay</u>	Duplicate Number <u>P6D04</u>
Date <u>9/17/93</u>	Checked By _____
Site <u>LF 6</u>	Date _____

Sampling Equipment HAND Auger, Stainless Steel Spools, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sand and clay w/ organics

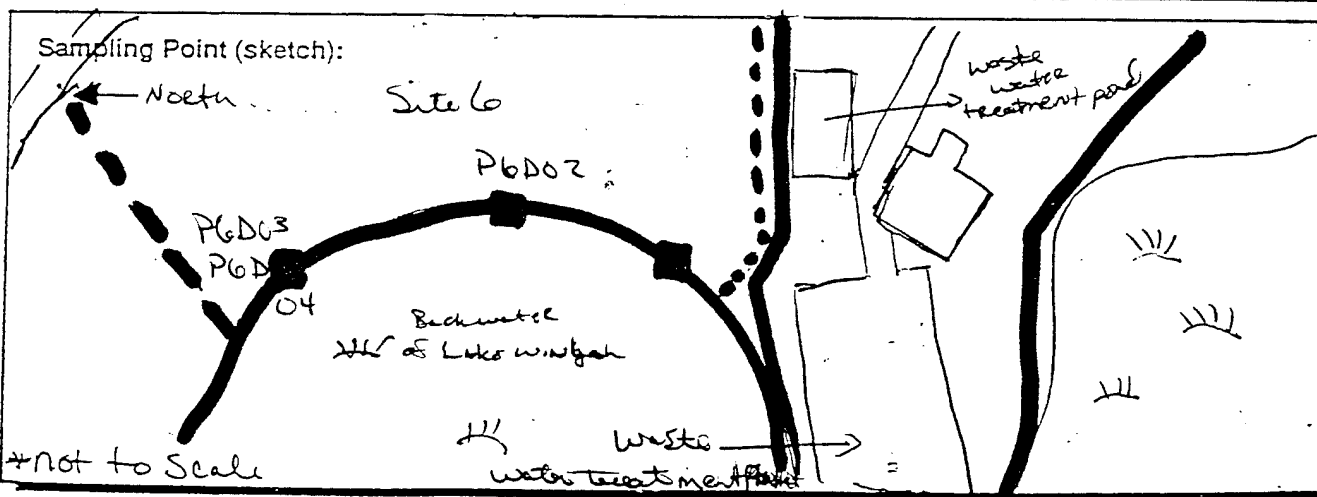
Color BLK

Odor Fetid

Depth 0-1'

Number of Samples 2

Comments \_\_\_\_\_



Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

**Appendix G: Monitoring Well Development  
and Sampling Forms**

## Well Development/Purge Log

Project Name Phelps Collins Ave Project No. 931800 (Well Mouth)  
 PHL/FID Readings 1 (Ambient) \_\_\_\_\_ (Water)  
 Static Levels 1.5' (Product) \_\_\_\_\_  
 Pump ☒ / Bail ☐ Rate \_\_\_\_\_ Total Gal. Extracted 20  
 Water Column Length 11.5 Well Volumes Extracted 10  
 Disposition of Discharge Water Containerized and Sampled for Disposal  
 Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs.

Well Information

Number	51 MW 1
Location	S. 4e 1
Datum	Tecumseh
Elev. Datum Point	
Ground Elev.	1,5'
Well Diameter	2"
Well Depth	13'
Well Material	PVC

**Equipment Information**

Bailer No. \_\_\_\_\_

Pump No. \_\_\_\_\_

Interface Probe No. \_\_\_\_\_

Sounder No. \_\_\_\_\_

pH Meter No. \_\_\_\_\_

Conductivity Meter No. \_\_\_\_\_

Thermometer No. \_\_\_\_\_

[illegible]

1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By DP Payne Date 8/28/93 Form F-1003  
Checked By PLC Date 9/22/93 9/1/91

Pump Bore

Pump Bore

Project Name Philips Collins ANG Project No. 931503

PID/FID Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)

Static Levels \_\_\_\_\_ (Product) 4.14' (Water)

Pump ☒ / Bail ☐ Rate \_\_\_\_\_ Total Gal. Extracted 20 gals

Water Column Length 8.86' Well Volumes Extracted 20-14

Disposition of Discharge Water Containerized and sampled for disposal

Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs.

[illegible]

radius = 1 ft length of  $\bar{r} = 0.0871\text{ ft}$  or 0.65 gal

1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By DF Sayre

Checked By FH

Date \_\_\_\_\_ Form F-1000

Date 9/22/53 161/91

## Well Development/Purge Log

Equipment Information

Bailer No. \_\_\_\_\_

Pump No. \_\_\_\_\_

Interface Probe No. \_\_\_\_\_

Sounder No. \_\_\_\_\_

pH Meter No. HAZCO # 2015

Conductivity Meter No. ET

Thermometer No. HAZCO # 2015

Well Information	
Number	<u>Simw 3</u>
Location	<u>Silver</u>
Datum	<u>Tec/sec</u>
Elev. Datum Point	
Ground Elev.	<u>3.79'</u>
Well Diameter	<u>3"</u>
Well Depth	<u>13.18'</u>
Well Material	<u>PVC</u>

Project Name Phelps Collins Ave Project No. 931800  
 PVI/FID Readings — (Ambient) — (Well Mouth)  
 Static Levels — (Product) 3.79' (Water)  
 Pump ☒ / Bail ☐ Rate — Total Gal. Extracted 18  
 Water Column Length 9.39' Well Volumes Extracted 12  
 Disposition of Discharge Water Contained and Sampled For disposal  
 Specific Capacity — (gpm/ft. drawdown) After — Hrs. —

[illegible]

Notes: 1 ft length of 4" = 0.087 fl 3 or 0.65 gal  
1 ft length of 2" = 0.022 fl 3 or 0.16 gal

Recorded By DP Jayne Date 8/28/93 Form F. 1003  
Checked By PLCag Date 9/22/93 9/1/91

## Well Development/Purge Log

Project Name Phelps Collins Ave Project No. \_\_\_\_\_  
 PII/FID Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)  
 Static Levels \_\_\_\_\_ (Product) 2.34' (Water)  
 Pump ☐ / Bail ☒ Ratio \_\_\_\_\_ Total Gal. Extracted 20  
 Water Column Length 10.9 Well Volumes Extracted 11.5  
 Disposition of Discharge Water containerized and sampled for disposal  
 Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs. \_\_\_\_\_

1 ft length of 4" = 0.087 fl.3 or 0.65 gal  
1 ft length of 2" = 0.022 fl.3 or 0.16 gal

## Well Development/Purge Log

**Equipment Information**

Bailer No. \_\_\_\_\_

Pump No. \_\_\_\_\_

Interface Probe No. \_\_\_\_\_

Sounder No. \_\_\_\_\_

pH Meter No. \_\_\_\_\_

Conductivity Meter No. \_\_\_\_\_

Thermometer No. \_\_\_\_\_

Well Information

Number 314026

Location Site 1

Datum TCC

Elev. Datum Point 417'

Ground Elev. 2"

Well Diameter 14.9'

Well Depth 14.9'

Well Material

Project Name Philips Collins AN6 Project No. 93/800-12  
 PID/FID Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)  
 Static Levels \_\_\_\_\_ (Product) 4.17 \_\_\_\_\_ (Water)  
 Pump ☒ / Bail ☐ Rate Enter gals per min Total Gal. Extracted 21  
 Water Column Length \_\_\_\_\_ Well Volumes Extracted 12  
 Disposition of Discharge Water Contained in 55 gallon drum  
 Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs.

[illegible]

Radius	1 ft length of 4" = 0.087 lb3	or 0.65 gal	note: water had noticeable hydrocarbon odor
	1 ft length of 2" = 0.022 lb3	or 0.16 gal	

Recorded By DPayne Date 9/10/93  
Checked By Pateuch Lay Date 9/22/93

[illegible]

1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By DFJaw Date 9/10/93  
Checked By 144

## Well Development/Purge Log

Project Name Phelps Collins A116 Project No. 931800

PHD/FID Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)

Static Levels \_\_\_\_\_ (Product) 6.34' \_\_\_\_\_ (Water)

Pump ☒ Bail ☐ Rate Grand EOS Total Gal. Extracted 40

Water Column Length 24.66 Well Volumes Extracted ~9.6

Disposition of Discharge Water Contained in 55 gallon drum

Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs.

[illegible]

1 ft length of 4" = 0.087 fl 3 or 0.65 gal  
1 ft length of 2" = 0.022 fl 3 or 0.16 gal

Form F-1003  
9/1/91

Date 9/12/93

Date 9/22/93



## Well Development/Purge Log

Equipment Information

Bailer No. \_\_\_\_\_

Pump No. \_\_\_\_\_

Interface Probe No. \_\_\_\_\_

Sounder No. \_\_\_\_\_

pH Meter No. <sup>DP-3</sup> ~~4020~~ # 2015

Conductivity Meter No. ET

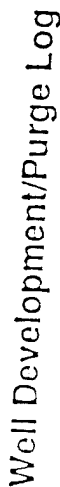
Thermometer No. 2015 A-ZCO

[illegible]

Notes. 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By DF Jayne  
Checked By FA Lang

Date 6/28/93 Form F-1003 9/1/91

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

## Well Development/Purge Log

Project Name Phelps Collins AN6 Project No. 931000-12

PID/FID Readings — (Ambient) — (Well Mouth)

Static Levels — (Product) 14.51' (Water)

Pump ☒ /Ball ☐ Rate Ground Fuel Total Gal. Extracted 315

Water Column Length 8.09' Well Volumes Extracted —

(Disposition of Discharge Water Contained in 55 gallon drum)

Specific Capacity — (gpm/ft. drawdown) After — Hrs.

[illegible]

Notes: 1 ft length of 4" = 0.087 fl3 or 0.65 gal  
1 ft length of 2" = 0.022 fl3 or 0.16 gal

Recorded By JKayne Date 9/16/93 Form F: 1003  
Checked By \_\_\_\_\_ Date \_\_\_\_\_ 9/1/91



# Well Development/Purge Log

Project Name Phelps Collins AN6 Project Number 931800 Page 1 of 1  
 Well No. 525 MW5 Datum Point 10200 # 3083 Date 8/25/93  
 Location Dev/Purge Method Boiler Conductivity Meter Number " Recorded By DFE/eyne  
 Equipment 2" 6000 psi Pump Static Water Level 6.74' Thermometer Number " Checked By "  
 Water Column 16' Casing Diameter 2" Date 8/25/93  
 Disposition of Discharge Water Average Discharge Rate 1.5 gpm  
 Specific Capacity 3/ Well Volumes

Time (24 hr.)	Flow Rate	Water Temp. In C°	pH	Cond. $\mu$ mhos/cm	Turbidity NTU	Gallons Drawn/Purge Before Meas.	Water Level (feet)	Remarks (e.g. clarity)
1011	1.5 gpm	25.4	7.49	0.620	+1000			muddy
1016	1.5 gpm	27.2	7.62	0.618	+1000	79		muddy
1018	1.5 gpm	25.4	7.61	0.587	+1000	108		muddy
1021	1.5 gpm	25.1	7.55	0.564	+1000	157		slightly clear
1025	1.5 gpm	25.3	7.55	0.584	+688	189		slightly clear
1027	1.5 gpm	27.4	7.59	0.558	142	27		mildly clear
1031	1.5 gpm	27.9	7.61	0.556	151	31	7.98'	
1032							7.4'	
1033							7.2'	
1034							7.08'	
1035							6.98'	

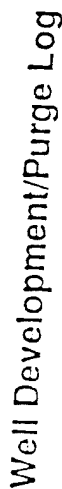
Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
 1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

# Well Development/Purge Log

Project Name Phelps Collins ANG Project Number 14200#3083 Page 1 of 1  
 Well No. SFS MW 6 Datum Point Static Water Level 6.78 Date 8/25/93  
 Location GroundFus Pump Elevation of Datum Point 2" Recorded By JSJ  
 Dev/Purge Method GroundFus Pump Static Water Level 6.78 Thermometer Number 2" Checked By JSJ  
 Equipment 15.4 Well Depth 15.4 Casing Diameter 2" Date 8/25/93  
 Water Column 15.4 Average Discharge Rate 2"  
 Disposition of Discharge Water Well Volumes  
 Specific Capacity gpm/ft. of draw down after hours

Time (24 hr.)	Flow Rate	Water Temp. In C°	pH	Cond. $\mu$ mhos/cm	Turbidity NTU	Gallons Dev./Purge Before Meas.	Water Level (feet)	Remarks (e.g. clarity)
1040	~3gpm	28.7	7.58	0.322	4000		—	muddy
1045	1.5gpm	30.2	7.62	0.290	+1000	-15	—	muddy
1049	1.5gpm	26.5	7.52	0.316	+1000	-18	—	muddy
1054	1.5gpm	27.73	7.57	0.309	+1000	25.5	—	muddy
1058	1.5gpm	27.2	7.6	0.318	+1000	28.0	—	muddy
1102	1.5gpm	29.8	7.45	0.343	+1000	31	—	slightly clear
1105	1.5gpm	25.1	7.61	0.330	1000	35.5	—	slightly clear
1112	1.5gpm	25.4	7.52	0.354	549	46	—	clear
1114							7.36'	
1115							7.10'	
1116							7.06'	
1117							7.02'	

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
 1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

## Well Development/Purge Log

Project Name phelps Collins A16 Project No. 937800-12

PID/FID Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)

Static Levels \_\_\_\_\_ (Product) 7.08' \_\_\_\_\_ (Water)

Pump ☒ /Ball ☐ Rate Groundfos Total Gal. Extracted 22.5

Water Column Length \_\_\_\_\_ Well Volumes Extracted \_\_\_\_\_

Disposition of Discharge Water Contained in a 55 gallon drum

Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs.

[illegible]

1 ft length of 4" = 0.087 lb3 or 0.65 gal  
 1 ft length of 2" = 0.022 lb3 or 0.16 gal

Recorded By DFJag Date 9/13/93 Form F-1003  
Checked By PHCag Date 9/22/93 9/1/91

## Well Development/Purge Log

Project Name Phelps Collins AN6 Project No. 93/800

PID/FID Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)

Static Levels \_\_\_\_\_ (Product) 7.32' (Water)

Pump ☒ Bail ☐ Rate \_\_\_\_\_ Total Gal. Extracted \_\_\_\_\_

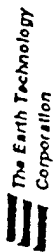
Water Column Length \_\_\_\_\_ Well Volumes Extracted \_\_\_\_\_

Disposition of Discharge Water Contained in 55 gallon drum

Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs. \_\_\_\_\_

	Turbid	No parameters taken because meter was broken
0848 0856	22.5	
0858 0859	7.37' 7.36'	

Recorded By DFJ/ane Date 9/12/93 Form F-1003  
Checked By pkh/aly Date 9/21/93 9/1/91



# Well Development/Purge Log

Project Name Phelps Collins AN6 Project Number 931800 Page 1 of 1  
Well No. LFE mw 4 Date 8/25/93  
Location Landfill 6 pH Meter Number Harco # 3083  
Dev/Purge Method 2" Grundfos Rediflow Conductivity Meter Number " Recorded By DFE  
Equipment 3/4" pipe Thermometer Number " Checked By "  
Water Column 7.76' Casing Diameter 2" Date "  
Disposition of Discharge Water " Average Discharge Rate 1.5 gal/min  
Specific Capacity " Well Volumes "  
gpm/ft. of draw down after " hours

Time (24 hr.)	Flow Rate	Water Temp. In C°	pH	Cond. µmhos/cm	Turbidity NTU	Gallons Dev/Purge Before Meas.	Water Level (feet)	Remarks (e.g. clarity)
1414	~1.5g	24.5°C	7.30	.289	+1000	0	12.24	Muddy
1419	1.5g	26.7°C	7.22	.275	+1000	8g	—	AS
1424	1.5g	27.3°C	7.22	.274	+1000	15g	—	AS
1429	1.5g	26.7°C	7.21	.272	+1000	23g	—	AS
1434	1.5g	26.8°C	7.21	.273	+1000	30g	—	Sl. less muddy
1439	1.5g	26.7°C	7.21	.272	398	38g	—	less turb.
1444	1.5g	26.6°C	7.22	.274	176	45g	—	less turb.
1447								13.12' H <sub>2</sub> O level
1448								12.96' H <sub>2</sub> O lev.
1449								12.80' H <sub>2</sub> O lev.

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

7.76 x .16 =

Project Name <u>Phelps Collins AN/6</u>		Project No. <u>931800</u>	
PID/FID Readings <u>—</u>	(Ambient) <u>—</u>	(Well Mouth)	
Static Levels <u>—</u>	(Product) <u>11.17'</u>	(Water)	
Pump <input checked="" type="checkbox"/> Bail <input type="checkbox"/> Rate <u>6 GPM/EE5</u>	Total Gal. Extracted <u>35</u>		
Water Column Length <u>—</u>	Well Volumes Extracted <u>—</u>		
Disposition of Discharge Water <u>Contained in poly tank</u>			
Specific Capacity <u>—</u>		(gpm/ft. drawdown) After <u>—</u> Hrs. <u>—</u>	

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1" of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By DK-Jayal  
Checked By \_\_\_\_\_

Date 8/25/93

Form F-1003  
3/15/92



gpm/ft. of draw down after--

Police Dept. 100-100000

## Well Volumes

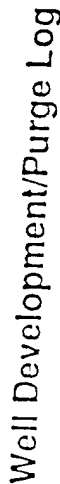
**Date**

[illegible]

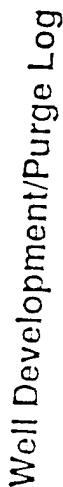
Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal



Flow rate not constant.

- water temp high due to water circulating through the pump.

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

## Well Development/Purge Log

Project Name Phelps Collins AN6 Project No. 931800

PID/FID Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)

Static Levels \_\_\_\_\_ (Product) 11' (Water)

Pump ☒ / Ball ☐ Rate 1 Liter/boiler Total Gal. Extracted 15

Water Column Length 4' Well Volumes Extracted 23.5

Disposition of Discharge Water Contained in poly tank

Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs. \_\_\_\_\_

Well Information

Number	456 MW 10
Location	Site 6
Datum	TAC
Elev. Datum Point	
Ground Elev.	11'
Well Diameter	2"
Well Depth	15'
Well Material	PVC

**Equipment Information**

Bailer No. \_\_\_\_\_

Pump No. \_\_\_\_\_

Interface Probe No. \_\_\_\_\_

Sounder No. \_\_\_\_\_

pH Meter No. \_\_\_\_\_

Conductivity Meter No. \_\_\_\_\_

Thermometer No. \_\_\_\_\_

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft<sup>3</sup> of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By MSeyne  
Checked By PA Lang

Date 9/14/93  
Date 9/22/93

Form F-1003  
3/15/92

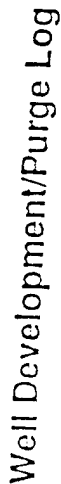
## Well Development/Purge Log

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By SK Jayne Date 7/12/93 Form F-1003 9/1/91

Checked By P. L. G. Date 9/22/93



Page \_\_\_\_\_ of \_\_\_\_\_

pH Meter Number H2250 # 2015  
 Conductivity Meter Number FEIC  
 Thermometer Number H2250 # 201  
 Casing Diameter 2'  
 Average Discharge Rate \_\_\_\_\_  
 Well Volumes \_\_\_\_\_

Date 8/31/93  
Recorded By DFJayne  
Checked By pkfay  
Date \_\_\_\_\_

Location Site 9  
 Dye/Purge Method Analyst Pump on Rig  
 Equipment \_\_\_\_\_  
 Water Column \_\_\_\_\_  
 Disposition of Discharge Water \_\_\_\_\_  
 Elevation of Datum Point \_\_\_\_\_  
 Static Water Level 14.61  
 Well Depth 23.5  
 Total Gallons Extracted 35

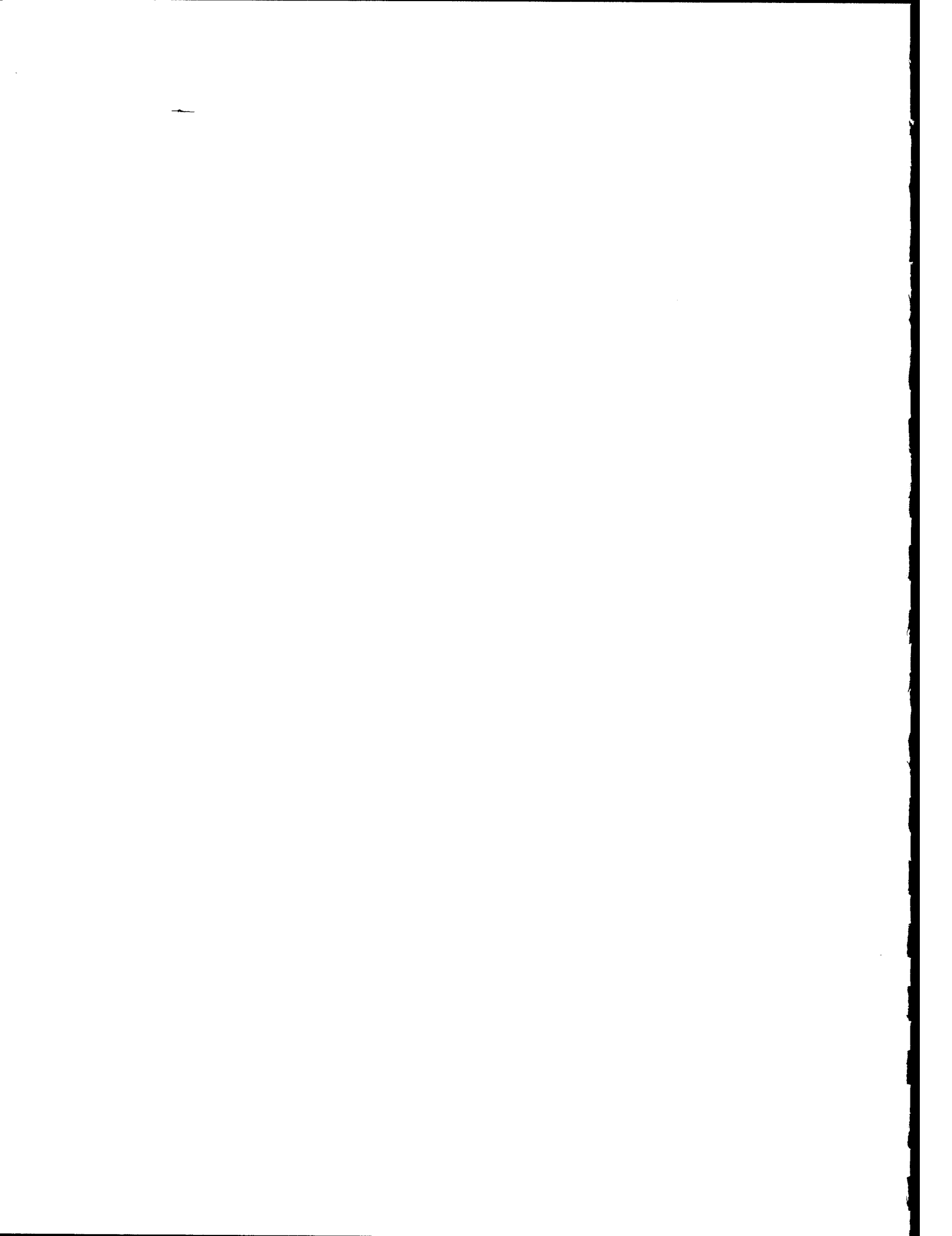
Water Column \_\_\_\_\_ Total Gallons Extracted 35

Disposition of Discharge Water \_\_\_\_\_

Specific Capacity \_\_\_\_\_ gpm/yd. of draw down after \_\_\_\_\_ hours

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal



## **Monitoring Well Sampling Forms**



# GROUNDWATER SAMPLING

Sample ID: P1mw1gw4

PROJECT NAME Phelps Collins ANG RT JOB NO: 931800-12 DATE: 9/14/93  
 WELL NO. MW1 LOCATION Site 1 Old P6L  
 WEATHER CONDITIONS Cool, Rainy AMBIENT TEMP: \_\_\_\_\_  
 PERSONNEL PHCag, JF DF Jayne  
 REVIEWED BY: DEF

EQUIPMENT USED: Bailer, rope, hand pump assembly, filter

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox+DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously purged? P9mw6

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox+DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P9mw6

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) - 0.3  
 Depth to bottom of well (ft.) 12.85'  
 Depth to water surface (ft.) 1.65'  
 Length of water (ft.) 11.2'  
 Volume of water (ft<sup>3</sup>) 0.2464  
 (gal.) 1.8  
 Amount of sediment at bottom of well (ft.) -  
 LNAPL (ft.) - DNAPL (ft.) -

## PURGING

Time started 2120 Finished 2140  
 Volume purged 10  
 Comments on Well Recovery immediate  
 Additional Comments -  
 Samples Collected: Start 1415 Finish 1430

## IN-SITU TESTING

Date:	<u>9/14/93</u>	<u>9/14/93</u>	<u>9/14/93</u>				
Time:	<u>2120</u>	<u>2130</u>	<u>2140</u>				
Water Level	<u>1.65</u>	<u>-</u>	<u>1.66</u>				
Well Volume Purged (gal.)	<u>0</u>	<u>5</u>	<u>10</u>				
Turbidity	<u>SI</u>	<u>mod</u>	<u>mod</u>				
Odor	<u>SI</u>	<u>SI</u>	<u>SI</u>				
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>				
pH (units)	<u>unable to calibrate</u>						
Conductivity ( $\mu$ mhos)	<u>PH and conductivity</u>						
Water Temperature ( $^{\circ}$ C)	<u>62.5</u>	<u>63.4</u>	<u>62.8</u>				

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P1mw2Gw4

PROJECT NAME Phelps Collins ANG RI JOB NO: 931800-12 DATE: 9/2/93  
 WELL NO. MW2 LOCATION Site 1  
 WEATHER CONDITIONS Sunny, windy AMBIENT TEMP: ~68°F  
 PERSONNEL Phelps, J. B. Norton  
 REVIEWED BY: DPJ

EQUIPMENT USED: Pump, Bailer, hose, Rope

## PURGING DEVICE

Type Device? Pump  
 How was the device decontaminated? See logbook  
 How was the <sup>ROSA</sup> ~~line~~ decontaminated? Alconox + DI wash to rinse  
 Which well was previously purged? P2mw7

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox + DI wash to rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P2mw7

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) -0.3'  
 Depth to bottom of well (ft.) 12.92  
 Depth to water surface (ft.) 3.72  
 Length of water (ft.) 9.2  
 Volume of water (ft<sup>3</sup>) 0.2024  
 (gal.) ~1.47  
 Amount of sediment at bottom of well (ft.) -  
 LNAPL (ft.) - DNAPL (ft.) -

## PURGING

Time started 1505 Finished 1536  
 Volume purged 7.5 gallons  
 Comments on Well Recovery Immediate  
 Additional Comments -  
 Samples Collected: Start 1540  
 Finish 1600

IN-SITU TESTING	Date:	9/5/93	9/9/93	9/9/93	9/9/93	9/9/93	9/9/93	9/9/93
	Time:	1505	1509	1516	1522	1530	1536	1600
Water Level		3.72'						3.74'
Well Volume Purged (gal.)		initial	1	2.5	4.5	6	7.5	-
Turbidity		SI.	SI	SI	SI.	SI.	SI	SI
Odor		none	none	none	none	none	none	none
Organic Vapor (ppm)		-	-	-	-	-	-	-
pH (units)		6.63	7.04	7.53	7.76	7.79	7.55	7.58
Conductivity (μ mhos)		349	373	429	430	421	404	401
Water Temperature (°C)		67.9	65.2	65.3	65.2	64.7	64.8	64.2

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P1mw36w4

PROJECT NAME Pileps Collins ANG RT JOB NO: 931800-12 DATE: 9/10/93  
 WELL NO. mw3 LOCATION Site 1  
 WEATHER CONDITIONS Sunny, Windy AMBIENT TEMP: ~58°F  
 PERSONNEL PKLay and BF Norton  
 REVIEWED BY: DFT

EQUIPMENT USED: Pump, Bailor, Rope, hose

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Pump</u>	Type Device? <u>Bailor</u>
How was the device decontaminated? <u>See logbook</u>	How was the device decontaminated? <u>see logbook</u>
How was the line decontaminated? <u>See logbook</u>	How was the line decontaminated? <u>dedicated</u>
Which well was previously purged? <u>P3mw4</u>	Which well was previously sampled? <u>P1mw4</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>1448</u> Finished <u>1518</u>
Stickup (ft.) <u>-0.3</u>	Volume purged <u>8.5 gals</u>
Depth to bottom of well (ft.) <u>13'</u>	Comments on Well Recovery <u>immediate</u>
Depth to water surface (ft.) <u>3.36'</u>	Additional Comments <u>—</u>
Length of water (ft.) <u>9.64</u>	
Volume of water (ft <sup>3</sup> ) <u>6.212</u>	
(gal.) <u>~1.54</u>	
Amount of sediment at bottom of well (ft.) <u>—</u>	Samples Collected: Start <u>1520</u>
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>	Finish <u>1530</u>

IN-SITU TESTING	Date: <u>9/10/93</u>	<u>9/10/93</u>	<u>9/10/93</u>	<u>9/10/93</u>	<u>9/10/93</u>		
	Time: <u>1448</u>	<u>1454</u>	<u>1504</u>	<u>1510</u>	<u>1518</u>		
Water Level	<u>3.36</u>				<u>3.37</u>		
Well Volume Purged (gal.)	<u>initial</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>		
Turbidity	<u>none</u>	<u>sl.</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>		
Odor	<u>none</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>noticeable</u>		
Organic Vapor (ppm)	<u>—</u>						
pH (units)	<u>8.65</u>	<u>7.16</u>	<u>7.7</u>	<u>7.38</u>	<u>7.33</u>		
Conductivity (μ mhos)	<u>962</u>	<u>976</u>	<u>992</u>	<u>979</u>	<u>977</u>		
Water Temperature (°C)	<u>61.3</u>	<u>62.3</u>	<u>60.9</u>	<u>60.6</u>	<u>60.4</u>		

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P1mw46w4

PROJECT NAME <u>Phelps Collins ANG RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/10/93</u>	
WELL NO. <u>mwh</u>		LOCATION <u>Site 1</u>			
WEATHER CONDITIONS <u>Cool, Rainy (Light)</u>		AMBIENT TEMP: <u>-55°F</u>			
PERSONNEL <u>P. H. Lay</u> <u>C. F. Norton</u>					
REVIEWED BY: <u>DFT</u>					
EQUIPMENT USED: <u>Bailer, rope, pump assembly, GAO filter</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>		
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>		
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>		
Which well was previously purged? <u>P6mwa</u>			Which well was previously sampled? <u>P6mwa</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1105</u> Finished <u>1125</u>		
Stickup (ft.) <u>-0.3</u>			Volume purged <u>8</u>		
Depth to bottom of well (ft.) <u>13.2'</u>			Comments on Well Recovery <u>immediate</u>		
Depth to water surface (ft.) <u>12.54'</u>			Additional Comments _____		
Length of water (ft.) <u>10.66</u>			_____		
Volume of water (ft <sup>3</sup> ) <u>0.23</u>			Samples Collected: Start <u>1235</u>		
(gal.) <u>~1.7</u>			Finish <u>1245</u>		
Amount of sediment at bottom of well (ft.) _____			_____		
LNAPL (ft.) _____ DNAPL (ft.) _____			_____		
IN-SITU TESTING					
Date:	<u>9/10/92</u>	<u>9/10/93</u>	<u>9/10/93</u>	<u>9/10/93</u>	<u>9/10/93</u>
Time:	<u>1105</u>	<u>1110</u>	<u>1115</u>	<u>1120</u>	<u>1125</u>
Water Level	<u>2.54'</u>	_____	_____	_____	<u>2.55</u>
Well Volume Purged (gal.)	<u>init. gal</u>	<u>3</u>	<u>5</u>	<u>6.5</u>	<u>8</u>
Turbidity	<u>SI.</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>
Odor	<u>SI.</u>	<u>SI.</u>	<u>SI.</u>	<u>SI.</u>	<u>SI.</u>
Organic Vapor (ppm)	_____	_____	_____	_____	_____
pH (units)	<u>7.27</u>	<u>7.25</u>	<u>7.19</u>	<u>7.33</u>	<u>7.13</u>
Conductivity (µ mhos)	<u>271</u>	<u>324</u>	<u>321</u>	<u>291</u>	<u>303</u>
Water Temperature (°C)	<u>61.0</u>	<u>63.0</u>	<u>63.2</u>	<u>62.3</u>	<u>61.6</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal					
Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91					

TETC154

# GROUNDWATER SAMPLING

Sample ID: P1mw06w4

PROJECT NAME Phelps Collins ANG RI JOB NO: 931800-12 DATE: 9/15/93  
 WELL NO. m06 LOCATION Site 1  
 WEATHER CONDITIONS Rainy, cool AMBIENT TEMP: -50°  
 PERSONNEL P. Hays and D. Jagne  
 REVIEWED BY: DJT

EQUIPMENT USED: Bailer, rope, pump assembly, Filter

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? Simw1

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P1mw1

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) -2  
 Depth to bottom of well (ft.) 14.95  
 Depth to water surface (ft.) 4.31  
 Length of water (ft.) 10.64'  
 Volume of water (ft<sup>3</sup>) 0.234  
 (gal.) 1.7 gals  
 Amount of sediment at bottom of well (ft.) -  
 LNAPL (ft.) - DNAPL (ft.) -

## PURGING

Time started 0940 Finished 1000  
 Volume purged 8  
 Comments on Well Recovery immediate  
 Additional Comments -  
 Samples Collected: Start 1952 Finish 2010

## IN-SITU TESTING

Date:	9/15/93	9/15/93	9/15/93				
Time:	0940	0950	1000				
Water Level	4.31		4.34				
Well Volume Purged (gal.)	-	4	8				
Turbidity	sl.	mod	very				
Odor	sl.	mod	strong				
Organic Vapor (ppm)	-	-	-				
pH (units)	instrument erratic - unable to calibrate						
Conductivity (μ mhos)	PH and conductivity						
Water Temperature (°C)	62.4	62.1	62.5				

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: Sim116w4  
PAC

PROJECT NAME Phelps Collins ANG RT JOB NO: 931800-12 DATE: 9/14/93  
WELL NO. MW 11 LOCATION Site 1 Old POL  
WEATHER CONDITIONS cool AMBIENT TEMP: PAC 50°F  
PERSONNEL PAL & DET  
REVIEWED BY: DET

EQUIPMENT USED: Bailer, rope, hand pump assembly, filter

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Bailer</u>	Type Device? <u>Bailer</u>
How was the device decontaminated? <u>ALCONDS + DI, DIENSA</u>	How was the device decontaminated? <u>Dedicated from purge</u>
How was the line decontaminated? <u>dedicated</u>	How was the line decontaminated? <u>dedicated</u>
Which well was previously purged? <u>P1mw12</u>	Which well was previously sampled? _____

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>0930</u> Finished <u>0950</u>
Stickup (ft.) <u>- 2'</u>	Volume purged <u>9.5</u>
Depth to bottom of well (ft.) <u>15'</u>	Comments on Well Recovery <u>immediate</u>
Depth to water surface (ft.) <u>3.58</u>	Additional Comments _____
Length of water (ft.) <u>11.42</u>	_____
Volume of water (ft <sup>3</sup> ) <u>0.25</u>	_____
(gal.) <u>1.8</u>	_____
Amount of sediment at bottom of well (ft.) <u>-</u>	Samples Collected: Start <u>1452</u>
LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>	Finish <u>1500</u>

IN-SITU TESTING	Date: <u>9/14/93</u>	<u>9/14/93</u>	<u>9/14/93</u>	_____	_____	_____	_____
	Time: <u>0930</u>	<u>0940</u>	<u>0950</u>	_____	_____	_____	_____
Water Level	<u>3.58</u>	<u>3.59</u>	<u>3.59</u>	_____	_____	_____	_____
Well Volume Purged (gal.)	<u>-</u>	<u>4.5</u>	<u>9.5</u>	_____	_____	_____	_____
Turbidity	<u>none</u>	<u>mod</u>	<u>mod</u>	_____	_____	_____	_____
Odor	<u>none</u>	<u>S1</u>	<u>S1</u>	_____	_____	_____	_____
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	_____	_____	_____	_____
pH (units)	<u>4.89</u>	<u>3.54</u>	<u>2.85</u>	<u>obviously is off line</u>	_____	_____	_____
Conductivity (μ mhos)	<u>unable to calibrate for conductivity</u>	_____	_____	_____	_____	_____	_____
Water Temperature (°C)	<u>61.4</u>	<u>62.1</u>	<u>61.6</u>	_____	_____	_____	_____

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: PM12GW4

PROJECT NAME Phelps Collins ANG RT JOB NO: 931800-12 DATE: 9/13/93  
 WELL NO. MW12 LOCATION Site 1 old POL  
 WEATHER CONDITIONS Cool, rain AMBIENT TEMP: ~52°F  
 PERSONNEL PHL  
 REVIEWED BY: DEF

EQUIPMENT USED: Bailer, rope, filter, hand pump assembly

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox+DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously purged? P8MW5

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox+DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled?

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) 15'  
 Depth to water surface (ft.) 3.27'  
 Length of water (ft.) 11.73  
 Volume of water (ft<sup>3</sup>) 0.258  
 (gal.) 1.9  
 Amount of sediment at bottom of well (ft.) -  
 LNAPL (ft.) - DNAPL (ft.) -

## PURGING

Time started: 1849 Finished 1908  
 Volume purged 10  
 Comments on Well Recovery immediate  
 Additional Comments  
 Samples Collected: Start 1430 Finish 1440

## IN-SITU TESTING

Date:	9/13/93	9/13/93	9/13/93				
Time:	1849	1858	1908				
Water Level	3.27	-	3.29				
Well Volume Purged (gal.)	-	5	10				
Turbidity	sl	mod	mod				
Odor	sl.	sl.	sl.				
Organic Vapor (ppm)	-	-	-				
pH (units)	unable to calibrate pH and cond.						
Conductivity (µ mhos)							
Water Temperature (°C)	60.2	60.8	61.4				

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P1M13Gw4

PROJECT NAME <u>Phelps Collins AUG RT</u>		JOB NO: <u>931500-12</u>	DATE: <u>9/14/93</u>
WELL NO. <u>MW13</u>		LOCATION <u>Site 1</u>	
WEATHER CONDITIONS <u>cool, Raining</u>		AMBIENT TEMP: <u>~60°</u>	
PERSONNEL <u>PHLay &amp; DF Jagan</u>			
REVIEWED BY: <u>DEF</u>			
EQUIPMENT USED: <u>Bailer hand pump assembly, filter</u>			
<b>PURGING DEVICE</b> Type Device? <u>Bailer</u> How was the device decontaminated? <u>Alconox + DI, DI RINSE</u> How was the line decontaminated? <u>dedicated</u> Which well was previously purged? <u>P1MW11</u>		<b>SAMPLING DEVICE</b> Type Device? <u>Bailer</u> How was the device decontaminated? <u>Alconox + DI, DI RINSE</u> How was the line decontaminated? <u>dedicated</u> Which well was previously sampled? <u>P1MW11</u>	
<b>INITIAL WELL VOLUME</b> Well diameter (in.) <u>2"</u> Stickup (ft.) <u>~2'</u> Depth to bottom of well (ft.) <u>15.35</u> Depth to water surface (ft.) <u>5.07</u> Length of water (ft.) <u>10.28</u> Volume of water (ft <sup>3</sup> ) <u>0.226</u> (gal.) <u>1.6</u> Amount of sediment at bottom of well (ft.) <u>-</u> LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>		<b>PURGING</b> Time started <u>1410</u> Finished <u>1422</u> Volume purged <u>8</u> Comments on Well Recovery <u>immediate</u> Additional Comments _____ Samples Collected: Start <u>1545</u> Finish <u>1600</u>	
<b>IN-SITU TESTING</b> Date: <u>9/14/93</u> <u>9/14/93</u> <u>9/14/93</u> Time: <u>1410</u> <u>1416</u> <u>1422</u>			
Water Level			
Well Volume Purged (gal.)			
Turbidity			
Odor			
Organic Vapor (ppm)			
pH (units)			
Conductivity (µ mhos)			
Water Temperature (°C)			
Notes:			
1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal.		1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal	
Turbidity choices:		Revision Date: 2-8-91	

TETC-154

# GROUNDWATER SAMPLING

Sample ID: P1m146w4

PROJECT NAME Phelps Collins AUG RT JOB NO: 931800-12 DATE: 9/15/93  
 WELL NO. m14 LOCATION Site 1 old POL Storage area  
 WEATHER CONDITIONS cool, Raining AMBIENT TEMP: ~50°F  
 PERSONNEL PHLay and DFJayne  
 REVIEWED BY: DFJ

EQUIPMENT USED: Pump, Bailer, hose

## PURGING DEVICE

Type Device? Pump  
 How was the device decontaminated? Alconox+DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously purged? P1m11

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox+DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P1m13

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) 32.21  
 Depth to water surface (ft.) 6.42  
 Length of water (ft.) 25.79  
 Volume of water (ft<sup>3</sup>) ~0.57  
 (gal.) ~4.12  
 Amount of sediment at bottom of well (ft.) —  
 LNAPL (ft.) — DNAPL (ft.) —

## PURGING

Time started: 0930 Finished 1050  
 Volume purged 22  
 Comments on Well Recovery Immediate  
 Additional Comments —  
 Samples Collected: Start 1050 Finish 1100

IN-SITU TESTING	Date: <u>9/15/93</u>	<u>9/15/93</u>	<u>9/15/93</u>	<u>9/15/93</u>			
Time:	<u>0930</u>	<u>0955</u>	<u>1025</u>	<u>1050</u>			
Water Level	<u>6.42</u>	<u>—</u>	<u>—</u>	<u>6.45</u>			
Well Volume Purged (gal.)	<u>—</u>	<u>7</u>	<u>15</u>	<u>22</u>			
Turbidity	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>			
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>			
Organic Vapor (ppm)	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>			
pH (units)	<u>unable to calibrate</u>						
Conductivity (µ mhos)	<u>pH and conductivity</u>						
Water Temperature (°C)	<u>61.4</u>	<u>61.2</u>	<u>60.8</u>	<u>61.3</u>			

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

## GROUNDWATER SAMPLING

Sample ID:

32mwi6w4  
PA7 (F)

5032011

10/2/2017

PROJECT NAME <u>Phelps Collins AND RT</u>		JOB NO: _____		DATE: <u>Aug 16, 1993</u>	
WELL NO. <u>MP2 m/w 1</u>		LOCATION <u>Site 2 motor pool</u>			
WEATHER CONDITIONS <u>warm-humid, hazy</u>		AMBIENT TEMP: <u>~85°</u>			
PERSONNEL <u>PH Lay &amp; M.E. Stoker</u>					
REVIEWED BY: <u>DRJ</u>					
EQUIPMENT USED: <u>Bailer, Rope, pump assembly, filter</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>		
How was the device decontaminated? <u>Per logbook</u>			How was the device decontaminated? <u>per logbook</u>		
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>		
Which well was previously purged? <u>none</u>			Which well was previously sampled? <u>none</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1455</u> Finished <u>1514</u>		
Stickup (ft.) <u>2'</u>			Volume purged <u>7.5 gal</u>		
Depth to bottom of well (ft.) <u>22'</u>			Comments on Well Recovery <u>Immediate</u>		
Depth to water surface (ft.) <u>8.48'</u>			Additional Comments _____		
Length of water (ft.) <u>13.52'</u>			_____		
Volume of water (ft <sup>3</sup> ) _____			Samples Collected: Start <u>1522</u>		
(gal.) <u>~2.2</u>			Finish <u>1537</u>		
Amount of sediment at bottom of well (ft.) _____			_____		
LNAPL (ft.) _____ DNAPL (ft.) _____			_____		
IN-SITU TESTING					
Date:	<u>8-10-93</u>	<u>8-16-93</u>	<u>8-16-93</u>	<u>8-16-93</u>	<u>8-10-93</u>
Time:	<u>1455</u>	<u>1502</u>	<u>1505</u>	<u>1514</u>	<u>1537</u>
Water Level	<u>8.48'</u>	_____	_____	<u>8.48</u>	_____
Well Volume Purged (gal.)	<u>0-</u>	<u>2.5 gal</u>	<u>5</u>	<u>7.5</u>	_____
Turbidity	<u>sl. + none</u>	<u>sl.</u>	<u>sl.</u>	<u>sl.</u>	<u>sl</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>non</u>	<u>non</u>
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	_____
pH (units)	<u>7.79</u>	<u>8.16</u>	<u>7.95</u>	<u>7.97</u>	<u>7.96</u>
Conductivity ( $\mu$ mhos)	<u>346</u>	<u>287</u>	<u>286</u>	<u>279</u>	<u>258</u>
Water Temperature (°C)	<u>70.6</u>	<u>68.0</u>	<u>65.1</u>	<u>67.5</u>	<u>67.6</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91					

# GROUNDWATER SAMPLING

Sample ID: P2mw2GW4

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800</u>	DATE: <u>8-16-93</u>																																																																						
WELL NO. <u>MW2</u>	LOCATION <u>Site 2 MW2</u>																																																																								
WEATHER CONDITIONS <u>Cloudy</u>		AMBIENT TEMP: <u>~70°F</u>																																																																							
PERSONNEL <u>Mark Stokes &amp; Mike Blizzard</u>																																																																									
REVIEWED BY: <u>PHL</u>																																																																									
EQUIPMENT USED: <u>pump, hose, hauler, filter</u>																																																																									
<b>PURGING DEVICE</b> Type Device? <u>pump</u> How was the device decontaminated? <u>see log book</u> How was the line decontaminated? <u>dedicated</u> Which well was previously purged? <u>PSmw1</u>		<b>SAMPLING DEVICE</b> Type Device? <u>hauler</u> How was the device decontaminated? <u>see log book</u> How was the line decontaminated? <u>dedicated</u> Which well was previously sampled? <u>PSmw1</u>																																																																							
<b>INITIAL WELL VOLUME</b> Well diameter (in.) <u>2"</u> Stickup (ft.) <u>2.3'</u> Depth to bottom of well (ft.) <u>18.20</u> Depth to water surface (ft.) <u>8.90</u> Length of water (ft.) <u>9.30</u> Volume of water (ft <sup>3</sup> ) <u>1.488 gal</u> (gal.) <u>4 = 5.952</u> Amount of sediment at bottom of well (ft.) _____ LNAPL (ft.) _____ DNAPL (ft.) _____		<b>PURGING</b> Time started <u>0845</u> Finished <u>0912</u> Volume purged <u>73</u> Comments on Well Recovery <u>immediate</u> Additional Comments <u>Collected Dup 2</u> <u>MSDS also. - well water</u> <u>is red w/ iron.</u> Samples Collected: Start <u>0915</u> Finish <u>0944</u>																																																																							
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>IN-SITU TESTING</th> <th>Date: <u>8-16-93</u></th> <th><u>8-16-93</u></th> <th><u>08-16-93</u></th> <th><u>08-16-93</u></th> <th><u>08-16-93</u></th> <th><u>08-16-93</u></th> </tr> </thead> <tbody> <tr> <td>Time:</td> <td><u>0845</u></td> <td><u>08:52</u></td> <td><u>08:59</u></td> <td><u>09:07</u></td> <td><u>09:12</u></td> <td><u>09:15</u></td> </tr> <tr> <td>Water Level</td> <td><u>8.90</u></td> <td></td> <td></td> <td></td> <td></td> <td><u>8.95</u></td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>8</u></td> <td><u>2</u></td> <td><u>4</u></td> <td><u>6</u></td> <td><u>7</u></td> <td></td> </tr> <tr> <td>Turbidity</td> <td><u>51</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> </tr> <tr> <td>Odor</td> <td><u>-0-</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> </tr> <tr> <td>pH (units)</td> <td><u>7.68</u></td> <td><u>6.98</u></td> <td><u>7.42</u></td> <td><u>7.29</u></td> <td><u>7.36</u></td> <td><u>7.41</u></td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td><u>192</u></td> <td><u>190</u></td> <td><u>216</u></td> <td><u>246</u></td> <td><u>238</u></td> <td><u>241</u></td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>63.2</u></td> <td><u>60.0</u></td> <td><u>59.2</u></td> <td><u>59.3</u></td> <td><u>59.1</u></td> <td><u>59.3</u></td> </tr> </tbody> </table>				IN-SITU TESTING	Date: <u>8-16-93</u>	<u>8-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>	Time:	<u>0845</u>	<u>08:52</u>	<u>08:59</u>	<u>09:07</u>	<u>09:12</u>	<u>09:15</u>	Water Level	<u>8.90</u>					<u>8.95</u>	Well Volume Purged (gal.)	<u>8</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>		Turbidity	<u>51</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	Odor	<u>-0-</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	pH (units)	<u>7.68</u>	<u>6.98</u>	<u>7.42</u>	<u>7.29</u>	<u>7.36</u>	<u>7.41</u>	Conductivity (µ mhos)	<u>192</u>	<u>190</u>	<u>216</u>	<u>246</u>	<u>238</u>	<u>241</u>	Water Temperature (°C)	<u>63.2</u>	<u>60.0</u>	<u>59.2</u>	<u>59.3</u>	<u>59.1</u>	<u>59.3</u>
IN-SITU TESTING	Date: <u>8-16-93</u>	<u>8-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>																																																																			
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Well Volume Purged (gal.)	<u>8</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>																																																																				
Turbidity	<u>51</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>																																																																			
Odor	<u>-0-</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>																																																																			
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>																																																																			
pH (units)	<u>7.68</u>	<u>6.98</u>	<u>7.42</u>	<u>7.29</u>	<u>7.36</u>	<u>7.41</u>																																																																			
Conductivity (µ mhos)	<u>192</u>	<u>190</u>	<u>216</u>	<u>246</u>	<u>238</u>	<u>241</u>																																																																			
Water Temperature (°C)	<u>63.2</u>	<u>60.0</u>	<u>59.2</u>	<u>59.3</u>	<u>59.1</u>	<u>59.3</u>																																																																			
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal Turbidity choices: clear, turbid, opaque 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal Revision Date: 2-8-91																																																																									

TETC-134

# GROUNDWATER SAMPLING

Sample ID: P2mw36v4

PROJECT NAME Phelps Collins RI JOB NO: 931800 DATE: 8-16-93  
 WELL NO. mw3 LOCATION Site 2  
 WEATHER CONDITIONS Cloudy AMBIENT TEMP: 27.2°F  
 PERSONNEL Mark Stokes & Mike Blizzard  
 REVIEWED BY: PLC

EQUIPMENT USED: pump, hose, bailer, filter

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>pump</u>	Type Device? <u>bailer</u>
How was the device decontaminated? <u>see log book</u>	How was the device decontaminated? <u>see log book</u>
How was the line decontaminated? <u>dedicated</u>	How was the line decontaminated? <u>dedicated</u>
Which well was previously purged? <u>2mw2</u>	Which well was previously sampled? <u>2mw2</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>10:20</u> Finished <u>11:00</u>
Slickup (ft.) <u>2.2'</u>	Volume purged <u>10 g</u>
Depth to bottom of well (ft.) <u>21.95</u>	Comments on Well Recovery
Depth to water surface (ft.) <u>8.45</u>	Additional Comments
Length of water (ft.) <u>13.50</u>	
Volume of water (ft <sup>3</sup> ) <u>2.16</u>	
(gal.) <u>8.64</u>	
Amount of sediment at bottom of well (ft.) <u>-</u>	Sample Collected: Start <u>11:05</u>
LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>	Finish <u>11:17</u>

IN-SITU TESTING	Date: <u>08-16-93</u>	<u>08/16/93</u>	<u>8/16/93</u>	<u>8/16/93</u>	<u>8/16/93</u>	<u>08-16-93</u>
	Time: <u>10:20</u>	<u>10:30</u>	<u>10:40</u>	<u>10:50</u>	<u>10:55</u>	<u>11:05</u>
Water Level	<u>8.45</u>					<u>8.49</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>10</u>
Turbidity	<u>51</u>					
Odor	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)	<u>7.37</u>	<u>7.47</u>	<u>7.46</u>	<u>7.39</u>	<u>7.45</u>	<u>7.44</u>
Conductivity (µ mhos)	<u>39</u>	<u>39</u>	<u>1.34</u>	<u>1.38</u>	<u>1.76</u>	<u>1.75</u>
Water Temperature (°C)	<u>61.7</u>	<u>61.7</u>	<u>62.3</u>	<u>60.8</u>	<u>59.9</u>	<u>59.3</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

# GROUNDWATER SAMPLING

Sample ID: P2mw46w4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931800</u>		DATE: <u>8-12-93</u>																																																																																	
WELL NO. <u>mw4</u>		LOCATION <u>Motor Pool Site 2</u>																																																																																			
WEATHER CONDITIONS <u>Warm, Sunny</u>		AMBIENT TEMP: <u>~68°F</u>																																																																																			
PERSONNEL <u>PH Lay, ME Stoker</u>																																																																																					
REVIEWED BY: <u>DFT</u>																																																																																					
EQUIPMENT USED: <u>Bailer, rope, hand pump assembly, filter</u>																																																																																					
PURGING DEVICE Type Device? <u>Bailer</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously purged? <u>P06mw1</u>			SAMPLING DEVICE Type Device? <u>Bailer</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously sampled? <u>P06mw1</u>																																																																																		
INITIAL WELL VOLUME Well diameter (in.) <u>2"</u> Stickup (ft.) <u>~2'</u> Depth to bottom of well (ft.) <u>22.2' BTOC</u> Depth to water surface (ft.) <u>8.78' + 4.42' BTOC</u> Length of water (ft.) <u>13.42' + 4.42' = 17.84'</u> Volume of water (ft <sup>3</sup> ) <u>~0.3</u> (gal.) <u>~2.2</u> Amount of sediment at bottom of well (ft.) <u>-</u> LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>			PURGING Time started <u>0730</u> Finished <u>0951</u> Volume purged <u>~11 gal/s</u> Comments on Well Recovery <u>immediate</u> Additional Comments <u>-</u> Samples Collected: Start <u>0928</u> Finish <u>1044</u>																																																																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>IN-SITU TESTING</th> <th>Date: <u>8-12-93</u></th> <th><u>8-12-93</u></th> <th><u>8-12-93</u></th> <th><u>8-12-93</u></th> <th><u>8-12-93</u></th> <th><u>8-12-93</u></th> <th><u>8-12-93</u></th> </tr> </thead> <tbody> <tr> <td>Time:</td> <td><u>930</u></td> <td><u>934</u></td> <td><u>937</u></td> <td><u>941</u></td> <td><u>945</u></td> <td><u>948</u></td> <td><u>1044</u></td> </tr> <tr> <td>Water Level</td> <td><u>8.78'</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>8.79</u></td> <td><u>8.79</u></td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>-0-</u></td> <td><u>2g</u></td> <td><u>4g</u></td> <td><u>6g</u></td> <td><u>8g</u></td> <td><u>10g</u></td> <td><u>-</u></td> </tr> <tr> <td>Turbidity</td> <td><u>sl</u></td> <td><u>sl</u></td> <td><u>sl</u></td> <td><u>sl</u></td> <td><u>sl</u></td> <td><u>sl</u></td> <td><u>sl</u></td> </tr> <tr> <td>Odor</td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> </tr> <tr> <td>pH (units)</td> <td><u>8.24</u></td> <td><u>8.06</u></td> <td><u>8.12</u></td> <td><u>8.06</u></td> <td><u>8.10</u></td> <td><u>8.07</u></td> <td><u>8.10</u></td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td><u>934</u></td> <td><u>942</u></td> <td><u>938</u></td> <td><u>898</u></td> <td><u>394</u></td> <td><u>342</u></td> <td><u>358</u></td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>60.3</u></td> <td><u>58.9</u></td> <td><u>57.8</u></td> <td><u>56.9</u></td> <td><u>56.7</u></td> <td><u>56.9</u></td> <td><u>57.2</u></td> </tr> </tbody> </table>						IN-SITU TESTING	Date: <u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	Time:	<u>930</u>	<u>934</u>	<u>937</u>	<u>941</u>	<u>945</u>	<u>948</u>	<u>1044</u>	Water Level	<u>8.78'</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>8.79</u>	<u>8.79</u>	Well Volume Purged (gal.)	<u>-0-</u>	<u>2g</u>	<u>4g</u>	<u>6g</u>	<u>8g</u>	<u>10g</u>	<u>-</u>	Turbidity	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	pH (units)	<u>8.24</u>	<u>8.06</u>	<u>8.12</u>	<u>8.06</u>	<u>8.10</u>	<u>8.07</u>	<u>8.10</u>	Conductivity (µ mhos)	<u>934</u>	<u>942</u>	<u>938</u>	<u>898</u>	<u>394</u>	<u>342</u>	<u>358</u>	Water Temperature (°C)	<u>60.3</u>	<u>58.9</u>	<u>57.8</u>	<u>56.9</u>	<u>56.7</u>	<u>56.9</u>	<u>57.2</u>
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<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.</p> <p>Turbidity choices: clear, turbid, opaque</p> <p>Revision Date: 2-8-91</p>																																																																																					

TETC-154

# GROUNDWATER SAMPLING

Sample ID: P2mw46w4

*Revised*

PROJECT NAME Phelps Collins RF JOB NO: 931800 DATE: 8-16-93  
 WELL NO. mw4 LOCATION Site 2  
 WEATHER CONDITIONS cloudy AMBIENT TEMP: ~75°F  
 PERSONNEL Mark Stotter & Mike Blizzard  
 REVIEWED BY: Pl-Lag

EQUIPMENT USED: peristaltic pump, teflon bailer, and metals filter

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Pump</u>	Type Device? <u>bailer</u>
How was the device decontaminated? <u>see log book</u>	How was the device decontaminated? <u>see log</u>
How was the line decontaminated? <u>dedicated</u>	How was the line decontaminated? <u>dedicated</u>
Which well was previously purged? <u>2mw3</u>	Which well was previously sampled? <u>2mw3</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>1415</u> Finished <u>1455</u>
Stickup (ft.) <u>22</u>	Volume purged <u>8.62</u>
Depth to bottom of well (ft.) <u>22.33</u>	Comments on Well Recovery <u>Recovery</u>
Depth to water surface (ft.) <u>8.85</u>	<u>Very good water at 8.9' after well</u>
Length of water (ft.) <u>13.48</u>	Additional Comments _____
Volume of water (ft <sup>3</sup> ) <u>2.15</u>	
(gal.) <u>2.15 gal</u>	
Amount of sediment at bottom of well (ft.) _____	Samples Collected: Start <u>1500</u>
LNAPL (ft.) _____ DNAPL (ft.) _____	Finish <u>2510</u>

IN-SITU TESTING	Date: <u>8-16</u>						
	Time: <u>1415</u>	<u>1420</u>	<u>1430</u>	<u>1440</u>	<u>1450</u>		
Water Level							
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>		
Turbidity							
Odor	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>			
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>			
pH (units)	<u>8.41</u>	<u>8.34</u>	<u>8.11</u>	<u>8.2</u>	<u>8.11</u>		
Conductivity (µ mhos)	<u>222</u>	<u>278</u>	<u>271</u>	<u>269</u>	<u>268</u>		
Water Temperature (°C)	<u>65.5</u>	<u>60.1</u>	<u>60</u>	<u>60</u>	<u>60.1</u>		

Notes: 1 ft. length of 4" = 0.087 m<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 m<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91 -

TETC154

## GROUNDWATER SAMPLING

Sample ID: P2mws6w4

PROJECT NAME <u>Phelps Collins RE</u>		JOB NO: <u>931800</u>	DATE: <u>8-12-93</u>				
WELL NO. <u>MWS</u>		LOCATION <u>Motor Pool Site 2</u>					
WEATHER CONDITIONS <u>Warm, sunny</u>		AMBIENT TEMP: <u>68°F</u>					
PERSONNEL <u>PH Lay M &amp; Stoker</u>							
REVIEWED BY: <u>DFT</u>							
EQUIPMENT USED: <u>Pump, hose, Boiler, pump assembly w/ Filter</u>							
PURGING DEVICE Type Device? <u>Pump (450 pump)</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously purged? <u>Pole MW1</u>		SAMPLING DEVICE Type Device? <u>Boiler</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously sampled? <u>Pole MW1</u>					
INITIAL WELL VOLUME Well diameter (In.) <u>2"</u> Stickup (ft.) <u>-2'</u> Depth to bottom of well (ft.) <u>57' BTOC</u> <u>8.63' BTOC</u> Length of water (ft.) <u>48.37</u> Volume of water (ft <sup>3</sup> ) <u>1.064</u> (gal.) <u>-7.75</u> Amount of sediment at bottom of well (ft.) _____ LNAPL (ft.) _____ DNAPL (ft.) _____		PURGING Time started <u>0917</u> Finished <u>1115</u> Volume purged <u>27 gal</u> Comments on Well Recovery <u>Immediate</u> Additional Comments _____ Samples Collected: Start <u>1120</u> Finish <u>1159</u>					
IN-SITU TESTING							
Date:	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>
Time:	<u>0920</u>	<u>0938</u>	<u>1002</u>	<u>1025</u>	<u>1050</u>	<u>1112</u>	<u>1159</u>
Water Level	<u>8.63'</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>8.67</u>
Well Volume Purged (gal.)	<u>-0-</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>-</u>
Turbidity	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Odor	<u>none</u>	<u>none</u>	<u>ROSE</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>Slight Su</u>
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>none</u>	<u>-0-</u>
pH (units)	<u>8.40</u>	<u>8.26</u>	<u>8.22</u>	<u>8.24</u>	<u>8.18</u>	<u>8.11</u>	<u>8.13</u>
Conductivity ( $\mu$ mhos)	<u>1164</u>	<u>1132</u>	<u>1134</u>	<u>1132</u>	<u>1136</u>	<u>1139</u>	<u>1148</u>
Water Temperature (°C)	<u>61.2</u>	<u>57.2</u>	<u>58.1</u>	<u>60.8</u>	<u>61.0</u>	<u>60.2</u>	<u>61.2</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal							
Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91							

# GROUNDWATER SAMPLING

Sample ID: P2MW5GW4 *Resample*

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/30/93

WELL NO. NW5 LOCATION Site 2

WEATHER CONDITIONS cloudy, breezy, humid AMBIENT TEMP: 70 °F

PERSONNEL J Smith M Stoken

REVIEWED BY: PHLg

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE

Type Device? Peristaltic Pump

How was the device decontaminated? See logbook

How was the line decontaminated? See logbook

Which well was previously purged? Site 6 MW6

SAMPLING DEVICE for metals → peristaltic pump

Type Device? teflon bailer for VOCs, SVOCs, TPH

How was the device decontaminated? DI water → methanol; air dry

How was the line decontaminated? disposable new nylon cord used each time

Which well was previously sampled? P6 MW6 GW4

INITIAL WELL VOLUME

Well diameter (in.) 2"

Stickup (ft.) ~2'

Depth to bottom of well (ft.) BDC ~57

Depth to water surface (ft.) BDC 8.25'

Length of water (ft.) 48.75'

Volume of water (ft<sup>3</sup>) 1.1

(gal.) 7.8

Amount of sediment at bottom of well (ft.) NM

LNAPL (ft.) NM DNAPL (ft.) NM

PURGING

Time started 1344 Finished 1420

Volume purged 25 gallons

Comments on Well Recovery \_\_\_\_\_

Additional Comments Sample for VOCs only due to Chempack's missed holding time

Sample Collected: Start 1420 Finish 1430

1430 sample time

23.4  
gallon  
minimum

IN-SITU TESTING	Date: <u>8/30/93</u>					
Time:	<u>1344</u>	<u>1350</u>	<u>1355</u>	<u>1408</u>	<u>1414</u>	<u>1420</u>
Water Level ft BDC	<u>8.24</u>	<u>8.27</u>	<u>8.28</u>	<u>8.31</u>	<u>8.30</u>	<u>8.30</u>
Well Volume Purged (gal.)	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>
Turbidity	<u>clear</u>	<u>cl</u>	<u>cl</u>	<u>cl</u>	<u>cl</u>	<u>cl</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>*</u>					
Conductivity (µ mhos)	<u>4560</u>	<u>780</u>	<u>869</u>	<u>1097</u>	<u>1097</u>	<u>1116</u>
Water Temperature (°F)	<u>63.9</u>	<u>59.2</u>	<u>59.5</u>	<u>60.0</u>	<u>64.3</u>	<u>54.5</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.

Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

NM = Not Measured \* pH meter expired

BDC = Below Top of Outer Steel Casing G-43

\* conductivity meter may be broken

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P2mw66w4

PROJECT NAME <u>Phelps Collins ANG RF</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/9/93</u>																																																																																		
WELL NO. <u>mw6</u>		LOCATION <u>Site 2 motor pool</u>																																																																																				
WEATHER CONDITIONS <u>Cool, rainy</u>		AMBIENT TEMP: <u>~60°</u>																																																																																				
PERSONNEL <u>Ph Lay &amp; RF Nolet</u>																																																																																						
REVIEWED BY: <u>DET</u>																																																																																						
EQUIPMENT USED: <u>Pump, hose, Bailer, rope</u>																																																																																						
PURGING DEVICE			SAMPLING DEVICE																																																																																			
Type Device? <u>Peristaltic pump</u>			Type Device? <u>Bailer</u>																																																																																			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>																																																																																			
How was the line decontaminated? <u>See logbook</u>			How was the line decontaminated? <u>dedicated</u>																																																																																			
Which well was previously purged? <u>P6mw9</u>			Which well was previously sampled? <u>P6mw9</u>																																																																																			
INITIAL WELL VOLUME			PURGING																																																																																			
Well diameter (in.) <u>2"</u>			Time started <u>0810</u> Finished <u>0912</u>																																																																																			
Stickup (ft.) <u>-0.3</u>			Volume purged <u>15 galls.</u>																																																																																			
Depth to bottom of well (ft.) <u>26.62</u>			Comments on Well Recovery <u>Immediate</u>																																																																																			
Depth to water surface (ft.) <u>7.93</u>			Additional Comments _____																																																																																			
Length of water (ft.) <u>18.69</u>			_____																																																																																			
Volume of water (ft <sup>3</sup> ) _____			_____																																																																																			
(gal.) <u>~2.99 or 3</u>			_____																																																																																			
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>0925</u>																																																																																			
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>0935</u>																																																																																			
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IN-SITU TESTING	Date: <u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>																																																																															
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Turbidity	<u>none</u>	<u>-</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>SL</u>	<u>mod</u>																																																																															
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<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque</p> <p>Revision Date: 2-8-91</p>																																																																																						

TETC134

# GROUNDWATER SAMPLING

Sample ID: P2mw7Gws4

PROJECT NAME _____		JOB NO: _____		DATE: <u>9/9/93</u>																																																																								
WELL NO. <u>mw7</u>		LOCATION <u>Motoe Pool Site 2</u>																																																																										
WEATHER CONDITIONS <u>cool, Rainy</u>		AMBIENT TEMP: <u>~62°F</u>																																																																										
PERSONNEL <u>JHLay and BFNorton</u>																																																																												
REVIEWED BY: <u>DJS</u>																																																																												
EQUIPMENT USED: _____																																																																												
PURGING DEVICE			SAMPLING DEVICE																																																																									
Type Device? <u>Pump</u>			Type Device? <u>Bailer</u>																																																																									
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>																																																																									
How was the line decontaminated? <u>See logbook</u>			How was the line decontaminated? <u>dedicated</u>																																																																									
Which well was previously purged? <u>P2mw6</u>			Which well was previously sampled? <u>P2mw6</u>																																																																									
INITIAL WELL VOLUME			PURGING																																																																									
Well diameter (in.) <u>2"</u>			Time started <u>1338</u> Finished <u>1410</u>																																																																									
Stickup (ft.) <u>-0.3</u>			Volume purged <u>7</u>																																																																									
Depth to bottom of well (ft.) <u>14.8</u>			Comments on Well Recovery <u>Immediate</u>																																																																									
Depth to water surface (ft.) <u>6.64</u>			Additional Comments _____																																																																									
Length of water (ft.) <u>8.16</u>			_____																																																																									
Volume of water (ft <sup>3</sup> ) <u>~0.18</u>			_____																																																																									
(gal.) <u>~1.3</u>			_____																																																																									
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>1412</u>																																																																									
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>1425</u>																																																																									
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IN-SITU TESTING	Date: <u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>																																																																						
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Turbidity	<u>mod</u>	<u>mod.</u>	<u>sl.</u>	<u>sl</u>	<u>none</u>	<u>mod</u>																																																																						
Odor	<u>sl.</u>	<u>mod</u>	<u>sl.</u>	<u>sl.</u>	<u>sl.</u>	<u>mod.</u>																																																																						
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Water Temperature (°C)	<u>62.1</u>	<u>63.4</u>	<u>63.5</u>	<u>65.6</u>	<u>63.7</u>	<u>63.8</u>																																																																						
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91</p>																																																																												

TETC154

# GROUNDWATER SAMPLING

Sample ID: P3MW6GW4

PROJECT NAME Phelps Collins #1 G JOB NO: 931800-12 DATE: 9/10/93  
 WELL NO. M06 LOCATION Site 3  
 WEATHER CONDITIONS Cool, Raining AMBIENT TEMP: ~58°F  
 PERSONNEL Phleg and BFN Oertel  
 REVIEWED BY: DE Jager

EQUIPMENT USED: Bailer, Rope, pump assembly, filter

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? Simms 4

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? Simms

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) ~0.3  
 Depth to bottom of well (ft.) 29.8'  
 Depth to water surface (ft.) 14.77'  
 Length of water (ft.) 13.03'  
 Volume of water (ft<sup>3</sup>) 0.2867  
 (gal.) ~21  
 Amount of sediment at bottom of well (ft.) —  
 LNAPL (ft.) — DNAPL (ft.) —

## PURGING

Time started 1345 Finished 1407  
 Volume purged 10 gal  
 Comments on Well Recovery moderate to immediate  
 Additional Comments —  
 Samples Collected: Start 1555 Finish 1620

IN-SITU TESTING	Date: <u>9/10/93</u>	<u>9/10/93</u>	<u>9/10/93</u>	<u>9/10/93</u>	<u>9/10/93</u>		
	Time: <u>1345</u>	<u>1351</u>	<u>1359</u>	<u>1403</u>	<u>1407</u>		
Water Level	<u>14.77</u>						
Well Volume Purged (gal.)	<u>initial</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>	<u>10</u>		
Turbidity	<u>SI</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>very</u>		
Odor	<u>SI</u>	<u>SI</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>		
Organic Vapor (ppm)	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>		
pH (units)	<u>7.89</u>	<u>7.94</u>	<u>7.78</u>	<u>7.58</u>	<u>7.66</u>		
Conductivity (μ mhos)	<u>952</u>	<u>991</u>	<u>502</u>	<u>506</u>	<u>928</u>		
Water Temperature (°C)	<u>55.7</u>	<u>56.2</u>	<u>55.4</u>	<u>52.9</u>	<u>53.1</u>		

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.18 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P3mw7Gw4

PROJECT NAME Phelps Collins AVG RT JOB NO: 931800-12 DATE: 7/13/93  
 WELL NO. MW7 LOCATION Site 3  
 WEATHER CONDITIONS Sunny Windy AMBIENT TEMP: ~65°F  
 PERSONNEL PHL and BCN  
 REVIEWED BY: DF Tague

EQUIPMENT USED: Pump (peristaltic) hose, Barker, rope,

## PURGING DEVICE

Type Device? Pump

How was the device decontaminated? See logbook

How was the line decontaminated? dedicated

Which well was previously purged? P6mw6Gw4  
Re-purged

## SAMPLING DEVICE

Type Device? Barker

How was the device decontaminated? See logbook

How was the line decontaminated? dedicated

Which well was previously sampled? P6mw6Gw4  
Re-sampled

## INITIAL WELL VOLUME

Well diameter (in.) 2"

Stickup (ft.) -0.3

Depth to bottom of well (ft.) 22' BTOC at mark

Depth to water surface (ft.) 14.5'

Length of water (ft.) 7.5'

Volume of water (ft<sup>3</sup>) 0.165

(gal.) 1.2

Amount of sediment at bottom of well (ft.)

LNAPL (ft.) DNAPL (ft.)

## PURGING

Time started 0925 Finished 1010

Volume purged 6.5 gals

Comments on Well Recovery Immediate

Additional Comments

Samples Collected: Start 1015

Finish 1025

IN-SITU TESTING	Date: <u>9/13/93</u>	<u>9/13/93</u>	<u>9/13/93</u>	<u>9/13/93</u>	<u>9/13/93</u>		
Time:	<u>0925</u>	<u>0940</u>	<u>0953</u>	<u>1008</u>	<u>1025</u>		
Water Level	<u>14.50</u>	<u>14.52</u>		<u>14.53</u>	<u>14.52</u>		
Well Volume Purged (gal.)	<u>initial</u>	<u>2 gal</u>	<u>4</u>	<u>6</u>	<u>-</u>		
Turbidity	<u>51</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>-</u>		
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>-</u>		
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>		
pH (units)	<u>8.07</u>	<u>8.34</u>	<u>8.46</u>	<u>8.39</u>	<u>8.25</u>		
Conductivity (μ mhos)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>		
Water Temperature (°C)	<u>66.7</u>	<u>62.5</u>	<u>62.3</u>	<u>62.4</u>	<u>62.7</u>		

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P3mw16w4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-15-93</u>		
WELL NO. <u>MW1</u>		LOCATION <u>County Garage Site 3</u>				
WEATHER CONDITIONS <u>cool, cloudy</u>		AMBIENT TEMP: <u>65°F</u>				
PERSONNEL <u>Phelan, M. S. Stoker</u>						
REVIEWED BY: <u>DJS</u>						
EQUIPMENT USED: <u>Pump/hose, bailer, rope</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Pump</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>see logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>D4mw1</u>			Which well was previously sampled? <u>P4 mw1</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>0932</u> Finished <u>1015</u> <u>DJS</u> <u>PHL 8-15-93</u>			
Stickup (ft.) <u>-2'</u>			Volume purged <u>9 gallons</u>			
Depth to bottom of well (ft.) <u>22.2</u>			Comments on Well Recovery <u>Immediate</u>			
Depth to water surface (ft.) <u>11.3' BTOC</u>			Additional Comments _____			
Length of water (ft.) <u>PHL 8-15-93 22.2 - 10.9' = 11.3'</u>			_____			
Volume of water (ft <sup>3</sup> ) <u>PHL 8-15-93 10.9' ~ 0.24 ft<sup>3</sup></u>			_____			
(gal.) <u>~ 1.75'</u>			_____			
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>1014</u>			
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>1020</u>			
IN-SITU TESTING		Date: <u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>
Time: <u>0933</u>		<u>0943</u>	<u>0953</u>	<u>1003</u>	<u>1013</u>	<u>1030</u>
Water Level		<u>11.3'</u>	_____	_____	_____	<u>11.3'</u>
Well Volume Purged (gal.)		<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>
Turbidity		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Odor		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)		<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
pH (units)		<u>7.85</u>	<u>8.17</u>	<u>8.13</u>	<u>8.20</u>	<u>8.18</u>
Conductivity (µmhos)		<u>283</u>	<u>262</u>	<u>260</u>	<u>258</u>	<u>241</u>
Water Temperature (°C)		<u>64.2</u>	<u>61.5</u>	<u>61.2</u>	<u>60.8</u>	<u>60.6</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal. Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91						

TETC154

# GROUNDWATER SAMPLING

Sample ID: P03MW29W4

PROJECT NAME Phelps Collins R1 JOB NO: 931800-12 DATE: 8/25/93  
 WELL NO. MW2 LOCATION Site 3  
 WEATHER CONDITIONS Hot, sunny, strong breeze AMBIENT TEMP: 95°F  
 PERSONNEL Play & J. Smith  
 REVIEWED BY: DPJ

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Peristaltic Pump</u>	Type Device? <u>metals → peristaltic pump</u>
How was the device decontaminated? <u>see logbook</u>	How was the device decontaminated? <u>DI water → methanol; air dry</u>
How was the line decontaminated? <u>see logbook</u>	How was the line decontaminated? <u>disposable new nylon cord used each time</u>
Which well was previously purged? <u>Site 3 MW3</u>	Which well was previously sampled? <u>P03MW34W4</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>1504</u> Finished <u>1538</u>
Stickup (ft.) <u>22'</u>	Volume purged <u>gallons</u>
Depth to bottom of well (ft.) <u>BTOC 32.21</u>	Comments on Well Recovery <u>none</u>
Depth to water surface (ft.) <u>BTOC 18.75</u>	Additional Comments <u>well had some fibers (from rope?) in it.</u>
Length of water (ft.) <u>13.46</u>	
Volume of water (ft <sup>3</sup> ) <u>0.3</u>	
(gal.) <u>2.2</u>	
Amount of sediment at bottom of well (ft.) <u>~0.1' NM</u>	Sample Collected: Start <u>1539</u>
LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>	Finish <u>1555</u>

IN-SITU TESTING Date: 8/25/93

	Time: <u>1504</u>	<u>1515</u>	<u>1533</u>	<u>1532</u>	<u>1538</u>	<u>1555</u>
Water Level # <u>BTOC</u>	<u>18.77</u>	<u>18.77</u>	<u>18.77</u>	<u>18.78</u>	<u>18.76</u>	<u>18.55</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2.5</u>	<u>5</u>	<u>7</u>	<u>8</u>	<u>8-25-93</u>
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>BL</u>
Odor	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>7.67</u>	<u>7.55</u>	<u>7.50</u>	<u>7.52</u>	<u>7.85</u>	<u>7.85</u>
Conductivity (µ mhos)	<u>532</u>	<u>507</u>	<u>5.20</u>	<u>4.88</u>	<u>559</u>	<u>559</u>
Water Temperature (°F)	<u>76.9</u>	<u>63.8</u>	<u>62.0</u>	<u>61.4</u>	<u>63.9</u>	<u>63.9</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC134

NM = Not Measured

G-49

BTOC = Below Top of (outer steel) casing

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P03 MW3 GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/25/93  
 WELL NO. MW3 LOCATION Sik 3  
 WEATHER CONDITIONS Sunny, clear, sl. breezy AMBIENT TEMP: ~75°F  
 PERSONNEL J. Smith & P. Lay  
 REVIEWED BY: DFS

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? see logbook  
 How was the line decontaminated? see logbook  
 Which well was previously purged? Sik 5 MW2

SAMPLING DEVICE for metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P05 MW2 GW4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BTOC 24.95  
 Depth to water surface (ft.) BTOC 14.08  
 Length of water (ft.) 10.87  
 Volume of water (ft<sup>3</sup>) 0.24  
 (gal.) 1.7  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 0951 Finished 1014  
 Volume purged gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 1014  
 Sample time 1030 Finish 1030

IN-SITU TESTING	Date: <u>8/25/93</u>					
	Time: <u>0951</u>	<u>1000</u>	<u>10:06</u>	<u>10:13</u>	<u>10:21</u>	<u>10:30</u>
Water Level <u>if BTOC</u>	<u>14.12</u>	<u>14.12</u>	<u>14.12</u>	<u>14.12</u>	<u>14.07</u>	<u>14.07</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2.5</u>	<u>4.5</u>	<u>6.0</u>	<u>6.5</u>	<u>6.5</u>
Turbidity	<u>sl. cloudy</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>
Odor	<u>None</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>7.46</u>	<u>7.60</u>	<u>7.63</u>	<u>7.65</u>	<u>7.82</u>	<u>7.82</u>
Conductivity (µmhos)	<u>472</u>	<u>425</u>	<u>420</u>	<u>430</u>	<u>492</u>	<u>492</u>
Water Temperature (°F)	<u>64.6</u>	<u>59.0</u>	<u>57.9</u>	<u>56.7</u>	<u>60.3</u>	<u>60.3</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC134

NM = Not Measured

G-50

BTOC = Below Top of (Outer steel) Casing

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P03MW4GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/25/93  
 WELL NO. MW4 LOCATION Site 3  
 WEATHER CONDITIONS Sunny, clear, sl. breezy AMBIENT TEMP: ~80°F  
 PERSONNEL J. Smith, P. Lays  
 REVIEWED BY: DF Jager

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE Type Device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>see logbook</u> How was the line decontaminated? <u>see logbook</u> Which well was previously purged? <u>Site 3 MW3</u>	SAMPLING DEVICE <u>for metals → peristaltic pump</u> Type Device? <u>stainless steel teflon bailer for VOCs, SVOCs, TPH</u> How was the device decontaminated? <u>JOS 8/25/93 Duster 8/25/93 DI water → possible alconox → DI water → methanol; airdry</u> How was the line decontaminated? <u>disposable new nylon cord used each time</u> Which well was previously sampled? <u>P03 MW3 GW4</u>
---	---

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) 22'  
 Depth to bottom of well (ft.) BTOC 32.00  
 Depth to water surface (ft.) BTOC 18.32  
 Length of water (ft.) 32.00 - 18.32 = 13.68  
 Volume of water (ft<sup>3</sup>) 0.37 0.30  
 (gal.) 2.7 2.18  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1049 Finished 1119  
 Volume purged ~8 gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 1120  
 Sample time: 1140 Finish 1140

IN-SITU TESTING	Date: <u>8/25/93</u>						
	Time: <u>1049</u>	<u>1101</u>	<u>1108</u>	<u>1119</u>	<u>1124</u>	<u>1135</u>	
Water Level # BTOC	<u>18.37</u>	<u>18.35</u>	<u>18.35</u>	<u>18.38</u>	<u>18.32</u>	<u>NM</u>	
Well Volume Purged (gal.)	<u>0</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>			
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>cloudy</u>	<u>cloudy</u>	
Odor	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	
pH (units)	<u>7.82</u>	<u>7.77</u>	<u>7.73</u>	<u>7.75</u>	<u>7.78</u>	<u>7.78</u>	
Conductivity (µ mhos)	<u>6.93</u>	<u>4.74</u>	<u>4.63</u>	<u>5.38</u>	<u>6.20</u>	<u>6.20</u>	
Water Temperature (°F) <u>8/25/93</u>	<u>72.5</u>	<u>64.1</u>	<u>63.2</u>	<u>64.3</u>	<u>67.6</u>	<u>67.6</u>	
Notes:	1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal.	1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal.					
Turbidity choices:	clear, turbid, opaque						

TETC134

NM = Not Measured

G-51

BTOC = Below Top of (Outer steel) Casing

after sampling

FIGURE 3-2

2.7  
x 3  
8.1 gal  
in 3 well  
Vols.  
  
2.2  
3  
6.6 gal  
in 3 well  
Vols.

# GROUNDWATER SAMPLING

Sample ID: ~~P3MWS~~ P3MW9GW4

and blind dupe  
P3MW9GW4  
(1200)

(double  
volume  
for MSM  
11:30

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/26/93  
WELL NO. MWS LOCATION Sik 3  
WEATHER CONDITIONS sunny, humid, calm AMBIENT TEMP: ~80 °F  
PERSONNEL P. Lag + J. Smith  
REVIEWED BY: DFS

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
Type Device? Peristaltic Pump  
How was the device decontaminated? see logbook  
How was the line decontaminated? see logbook  
Which well was previously purged? Sik 3 MW2

SAMPLING DEVICE metals → peristaltic pump  
Type Device? teflon bailer for VOCs, SVOCs, TPH  
How was the device decontaminated? DI water → acetone → DI water → methanol; air dry  
How was the line decontaminated? disposable new nylon cord used each time  
Which well was previously sampled?

INITIAL WELL VOLUME  
Well diameter (in.) 2"  
Stickup (ft.) ~2'  
Depth to bottom of well (ft.) BTOC 57.54'  
Depth to water surface (ft.) BTOC 18.50'  
Length of water (ft.) 39.04'  
Volume of water (ft<sup>3</sup>) 0.86  
(gal.) 6.2  
Amount of sediment at bottom of well (ft.) NM  
LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
Time started 0942 Finished 1110  
Volume purged ~22 gallons  
Comments on Well Recovery none  
Additional Comments none  
Samples Collected: Start 1111  
1130 time sample / MSMSD Finish 1138  
1200 time end dupe

IN-SITU TESTING	Date: <u>8/24/93</u>						
	Time: <u>0943</u>	<u>1002</u>	<u>1021</u>	<u>1040</u>	<u>1101</u>	<u>1112</u>	<u>1138</u>
Water Level if BTOC	<u>1857</u>	<u>1858</u>	<u>1858</u>	<u>1858</u>	<u>1857</u>	<u>1847</u>	<u>NM</u>
Well Volume Purged (gal.)	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>		<u>~22</u>
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>7.17</u>	<u>7.92</u>	<u>8.18</u>	<u>8.03</u>	<u>8.11</u>	<u>8.81</u>	<u>8.81</u>
Conductivity (µ mhos)	<u>292</u>	<u>323</u>	<u>432</u>	<u>340</u>	<u>335</u>	<u>332</u>	<u>332</u>
Water Temperature (°F)	<u>70.5</u>	<u>61.7</u>	<u>64.2</u>	<u>66.4</u>	<u>63.7</u>	<u>65.5</u>	<u>65.5</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal  
Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-52

BTOC = Below Top of (Outer steel) Casing

FIGURE 3-2

# GROUNDWATER SAMPLING

TF4MW1

Sample ID: P4mw1Gw4

PROJECT NAME <u>Phelps Collins</u>		JOB NO: <u>931800</u>		DATE: <u>8-14-93</u>		
WELL NO. <u>MW1</u>		LOCATION <u>Site 4</u>				
WEATHER CONDITIONS <u>Sunny, warm</u>		AMBIENT TEMP: <u>76°F</u>				
PERSONNEL <u>PH Lay, m0 stoker</u>						
REVIEWED BY: <u>JSBmege 9/21/93</u> *samples unusable - arrived warm						
EQUIPMENT USED: <u>Bailer, rope, pump assembly, filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>PS MW 2</u>			Which well was previously sampled? <u>PS MW 2</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>0926</u> Finished <u>0945</u>			
Stickup (ft.) <u>2'</u>			Volume purged <u>9 gals</u>			
Depth to bottom of well (ft.) <u>36.0'</u>			Comments on Well Recovery <u>immediate</u>			
Depth to water surface (ft.) <u>23.2'</u>			Additional Comments <u>—</u>			
Length of water (ft.) <u>12.8</u>						
Volume of water (ft <sup>3</sup> ) <u>0.28</u>						
(gal.) <u>~2</u>						
Amount of sediment at bottom of well (ft.) <u>—</u>			Samples Collected: Start <u>1016</u>			
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>			Finish <u>1050</u>			
IN-SITU TESTING	Date:	<u>08/14/93</u>	<u>8/14/93</u>	<u>8-14-93</u>	<u>8-14-93</u>	<u>8-14-93</u>
	Time:	<u>0926</u>	<u>0930</u>	<u>0935</u>	<u>0940</u>	<u>0945</u>
Water Level		<u>23.2'</u>			<u>23.2</u>	<u>23.2</u>
Well Volume Purged (gal.)		<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>
Turbidity		<u>None</u>	<u>SI. PAL</u>	<u>SI. PAL</u>	<u>SI. PAL</u>	<u>SI. PAL</u>
Odor		<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>
Organic Vapor (ppm)		<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)		<u>8.16</u>	<u>8.34</u>	<u>8.38</u>	<u>8.36</u>	<u>8.55</u>
Conductivity (µ mhos)		<u>314</u>	<u>268</u>	<u>272</u>	<u>268</u>	<u>264</u>
Water Temperature (°C)		<u>60.8</u>	<u>57.7</u>	<u>56.5</u>	<u>56.4</u>	<u>56.7</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91						

TETC154

# GROUNDWATER SAMPLING

TF4MW1 Resample

Sample ID: P4 MW16W4

PROJECT NAME <u>Phelps Collins</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-17-93</u>		
WELL NO. <u>MW1</u>		LOCATION <u>Site 4 Third fire training area</u>				
WEATHER CONDITIONS <u>Hot, Hazy</u>		AMBIENT TEMP: <u>-85°F</u>				
PERSONNEL <u>Phelan &amp; M. Stoker</u>						
REVIEWED BY: <u>JS Bruegel</u> <u>9/21/93</u> * well resampled - samples arrived at lab warm						
EQUIPMENT USED: <u>Bailer, rope, pump assembly, filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? _____			Which well was previously sampled? _____			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>1442</u> Finished <u>1503</u>			
Stickup (ft.) <u>~2</u>			Volume purged <u>10 gals</u>			
Depth to bottom of well (ft.) <u>36'</u>			Comments on Well Recovery <u>immediate</u>			
Depth to water surface (ft.) <u>23.21</u>			Additional Comments _____			
Length of water (ft.) <u>12.79</u>			_____			
Volume of water (ft <sup>3</sup> ) <u>0.28</u>			_____			
(gal.) <u>~2</u>			_____			
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>1523</u>			
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>1550</u>			
IN-SITU TESTING						
Date:	<u>8-17-93</u>					
Time:	<u>14:46</u>	<u>14:49</u>	<u>14:51</u>	<u>14:53</u>	<u>14:57</u>	<u>1501</u>
Water Level	<u>23.21</u>					<u>23.25</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>10</u>
Turbidity	<u>sl</u>	<u>sl</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)	<u>7.75</u>	<u>7.64</u>	<u>7.70</u>	<u>7.67</u>	<u>7.68</u>	<u>7.65</u>
Conductivity (µ mhos)	<u>314</u>	<u>297</u>	<u>258</u>	<u>248</u>	<u>242</u>	<u>245</u>
Water Temperature (°C)	<u>64.0</u>	<u>60.2</u>	<u>59.9</u>	<u>56.8</u>	<u>56.7</u>	<u>56.7</u>
Notes: 1 ft. length of 4" = 0.087 m <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 m <sup>3</sup> or 0.16 gal. Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91						

TETC154

TF4 MW 2

The Earth Technology Corporation

## GROUNDWATER SAMPLING

Sample ID: P046MW42

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-11-93</u>		
WELL NO. <u>P046 MW 2</u>		LOCATION <u>Site 4, Third Fire Training area</u>				
WEATHER CONDITIONS <u>cool Sunny</u>		AMBIENT TEMP: <u>~72°F</u>				
PERSONNEL <u>P.H. Lay, M.C. Stoker</u>						
REVIEWED BY: <u>JSBriegel 9/21/93</u>						
EQUIPMENT USED: <u>Bailer, rope, pump assembly + fittings, Filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>P046 MW 3</u>			Which well was previously sampled? <u>P4 MW 3</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>1009</u> Finished <u>1021</u>			
Stickup (ft.) <u>2'</u>			Volume purged <u>5 gallons</u>			
Depth to bottom of well (ft.) <u>37.2' BTAC</u>			Comments on Well Recovery <u>Immediate</u>			
Depth to water surface (ft.) <u>29' BTAC</u>			Additional Comments <u>-</u>			
Length of water (ft.) <u>8.2'</u>						
Volume of water (ft <sup>3</sup> ) <u>0.18</u>						
(gal.) <u>~1.3</u>						
Amount of sediment at bottom of well (ft.) <u>-</u>			Samples Collected: Start <u>1025</u>			
LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>			Finish <u>1034</u>			
IN-SITU TESTING		Date: <u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>
		Time: <u>1009</u>	<u>1013</u>	<u>1017</u>	<u>1021</u>	<u>1034</u>
Water Level		<u>29'</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>29.03'</u>
Well Volume Purged (gal.)		<u>-0-</u>	<u>2</u>	<u>4</u>	<u>5</u>	<u>-</u>
Turbidity		<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>
Odor		<u>none</u>	<u>non</u>	<u>non</u>	<u>none</u>	<u>non</u>
Organic Vapor (ppm)		<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>0</u>	<u>-0-</u>
pH (units)		<u>8.21</u>	<u>7.97</u>	<u>7.92</u>	<u>7.69</u>	<u>7.58</u>
Conductivity ( $\mu$ mhos)		<u>299</u>	<u>271</u>	<u>369</u>	<u>310</u>	<u>320</u>
Water Temperature (°C)		<u>60.1</u>	<u>58.1</u>	<u>56.8</u>	<u>56.5</u>	<u>56.7</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal. Turbidity choices: clear, turbid, opaque. Revision Date: 2-8-91						

TETC154

# GROUNDWATER SAMPLING

TF4 MW3

Sample ID: P046MW3

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-11-93</u>																																																																								
WELL NO. <u>MW3</u>		LOCATION <u>Site 4 Third Fire training area</u>																																																																										
WEATHER CONDITIONS <u>cool -70°</u>		AMBIENT TEMP: <u>-70°</u>																																																																										
PERSONNEL <u>P. A. Lay, M. E. Stoker</u>																																																																												
REVIEWED BY: <u>J. S. Biegel 9/21/93</u>																																																																												
EQUIPMENT USED: <u>Bailer, pump assembly, fittings, filter, rope</u>																																																																												
PURGING DEVICE			SAMPLING DEVICE																																																																									
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>																																																																									
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>see logbook</u>																																																																									
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>																																																																									
Which well was previously purged? <u>none</u>			Which well was previously sampled? <u>none</u>																																																																									
INITIAL WELL VOLUME			PURGING																																																																									
Well diameter (in.) <u>2"</u>			Time started <u>0858</u> Finished <u>0920</u>																																																																									
Stickup (ft.) <u>2'</u>			Volume purged <u>7.5 gal</u>																																																																									
Depth to bottom of well (ft.) <u>36.7 BTOC</u>			Comments on Well Recovery <u>immediate</u>																																																																									
Depth to water surface (ft.) <u>24.85 BTOC</u>			Additional Comments _____																																																																									
Length of water (ft.) <u>10.05</u>			_____																																																																									
Volume of water (ft <sup>3</sup> ) <u>2.49-11-93</u>			Samples Collected: Start <u>0925</u>																																																																									
Volume of water (gal.) <u>1.6 gal</u>			Finish <u>0940</u>																																																																									
Amount of sediment at bottom of well (ft.) <u>—</u>			_____																																																																									
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>			_____																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>IN-SITU TESTING</th> <th>Date: <u>8-11-93</u></th> <th><u>8-11-93</u></th> <th><u>8-11-93</u></th> <th><u>8-11-93</u></th> <th><u>8-11-93</u></th> <th><u>8-11-93</u></th> </tr> </thead> <tbody> <tr> <td>Time:</td> <td><u>0858</u></td> <td><u>0906</u></td> <td><u>0912</u></td> <td><u>0918</u></td> <td><u>0920</u></td> <td><u>0940</u></td> </tr> <tr> <td>Water Level</td> <td><u>26.85</u></td> <td><u>—</u></td> <td><u>—</u></td> <td><u>—</u></td> <td><u>26.94</u></td> <td><u>26.95</u></td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>in. field</u></td> <td><u>2 gal</u></td> <td><u>3.5</u></td> <td><u>5 gal</u></td> <td><u>7 gal</u></td> <td><u>—</u></td> </tr> <tr> <td>Turbidity</td> <td><u>SI</u></td> <td><u>SI</u></td> <td><u>SI</u></td> <td><u>SI</u></td> <td><u>SI</u></td> <td><u>SI</u></td> </tr> <tr> <td>Odor</td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> </tr> <tr> <td>pH (units)</td> <td><u>8.22</u></td> <td><u>7.71</u></td> <td><u>8.30</u></td> <td><u>8.37</u></td> <td><u>8.26</u></td> <td><u>8.30</u></td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td><u>477</u></td> <td><u>424</u></td> <td><u>431</u></td> <td><u>424</u></td> <td><u>414</u></td> <td><u>450</u></td> </tr> <tr> <td>Water Temperature (°F)</td> <td><u>60.2</u></td> <td><u>58.8</u></td> <td><u>58.4</u></td> <td><u>58.6</u></td> <td><u>58.4</u></td> <td><u>58.5</u></td> </tr> </tbody> </table>							IN-SITU TESTING	Date: <u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	Time:	<u>0858</u>	<u>0906</u>	<u>0912</u>	<u>0918</u>	<u>0920</u>	<u>0940</u>	Water Level	<u>26.85</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>26.94</u>	<u>26.95</u>	Well Volume Purged (gal.)	<u>in. field</u>	<u>2 gal</u>	<u>3.5</u>	<u>5 gal</u>	<u>7 gal</u>	<u>—</u>	Turbidity	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	pH (units)	<u>8.22</u>	<u>7.71</u>	<u>8.30</u>	<u>8.37</u>	<u>8.26</u>	<u>8.30</u>	Conductivity (µ mhos)	<u>477</u>	<u>424</u>	<u>431</u>	<u>424</u>	<u>414</u>	<u>450</u>	Water Temperature (°F)	<u>60.2</u>	<u>58.8</u>	<u>58.4</u>	<u>58.6</u>	<u>58.4</u>	<u>58.5</u>
IN-SITU TESTING	Date: <u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>																																																																						
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Well Volume Purged (gal.)	<u>in. field</u>	<u>2 gal</u>	<u>3.5</u>	<u>5 gal</u>	<u>7 gal</u>	<u>—</u>																																																																						
Turbidity	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>																																																																						
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>																																																																						
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>																																																																						
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Water Temperature (°F)	<u>60.2</u>	<u>58.8</u>	<u>58.4</u>	<u>58.6</u>	<u>58.4</u>	<u>58.5</u>																																																																						
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91</p>																																																																												

TETC154

TETC 154

# GROUNDWATER SAMPLING

Sample ID: PSMW1GWS4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8-15-93  
WELL NO. MW1 LOCATION Site S old 6th 2nd Fire training area  
WEATHER CONDITIONS Cool windy cloudy AMBIENT TEMP: ~72°F  
PERSONNEL M. Stoker & P. H. Lay  
REVIEWED BY: DKJ

EQUIPMENT USED: Pump, hose, Bailor, filter

## PURGING DEVICE

Type Device? Pump  
How was the device decontaminated? See logbook  
How was the line decontaminated? ded. catel  
Which well was previously purged? P8mw1

## SAMPLING DEVICE

Type Device? Bailor  
How was the device decontaminated? See logbook  
How was the line decontaminated? ded. catel  
Which well was previously sampled? P8mw1

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
Stickup (ft.) ~2'  
Depth to bottom of well (ft.) 22.33'  
Depth to water surface (ft.) 7.29  
Length of water (ft.) 15.04  
Volume of water (ft<sup>3</sup>) 0.33  
(gal.) 2.4  
Amount of sediment at bottom of well (ft.) \_\_\_\_\_  
LNAPL (ft.) \_\_\_\_\_ DNAPL (ft.) \_\_\_\_\_

## PURGING

Time started 1423 Finished 1515  
Volume purged 13.5 gals  
Comments on Well Recovery immediate  
Additional Comments \_\_\_\_\_  
Samples Collected: Start 1530  
Finish 1550

## IN-SITU TESTING

	Date: <u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>
Time:	<u>1423</u>	<u>1433</u>	<u>1439</u>	<u>1450</u>	<u>1458</u>	<u>1512</u>	<u>1530</u>
Water Level	<u>7.29'</u>						<u>7.35</u>
Well Volume Purged (gal.)	<u>-0-</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>	<u>10</u>	<u>13</u>	<u>15</u>
Turbidity	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>
Odor	<u>SI, organic</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>
Organic Vapor (ppm)	<u>-0-</u>						
pH (units)	<u>6.94</u>	<u>6.61</u>	<u>6.15</u>	<u>6.17</u>	<u>6.50</u>	<u>6.90</u>	<u>6.78</u>
Conductivity (µ mhos)	<u>517</u>	<u>445</u>	<u>454</u>	<u>438</u>	<u>451</u>	<u>474</u>	<u>468</u>
Water Temperature (°C)	<u>65.8</u>	<u>64.7</u>	<u>62.9</u>	<u>63.5</u>	<u>62.8</u>	<u>61.7</u>	<u>62.3</u>

Notes:

1 ft. length of 4"

Turbidity choices:

= 0.087 ft<sup>3</sup> or 0.65 gal.

clear, turbid, opaque

1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Revision Date: 2-8-91

TETC154

G-58

FIGURE 3-2

## GROUNDWATER SAMPLING

Sample ID: PSMW26W4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>981800-12</u>		DATE: <u>8-13-93</u>	
WELL NO. <u>MW2</u>		LOCATION <u>Site 5</u>			
WEATHER CONDITIONS <u>Sunny, hot, hazy</u>		AMBIENT TEMP: <u>82°</u>			
PERSONNEL <u>PHLag, MS Blizard</u>					
REVIEWED BY: <u>DEF</u>					
EQUIPMENT USED: <u>Bailer, Pump Assembly, Filter</u>					

<p><b>PURGING DEVICE</b></p> <p>Type Device? <u>Bailer</u></p> <p>How was the device decontaminated? <u>See logbook</u></p> <p>How was the line decontaminated? <u>dedicated</u></p> <p>Which well was previously purged? <u>PSMW4</u></p>	<p><b>SAMPLING DEVICE</b></p> <p>Type Device? <u>Bailer</u></p> <p>How was the device decontaminated? <u>See logbook</u></p> <p>How was the line decontaminated? <u>dedicated</u></p> <p>Which well was previously sampled? <u>PSMW4</u></p>
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<p><b>INITIAL WELL VOLUME</b></p> <p>Well diameter (in.) <u>2"</u></p> <p>Stickup (ft.) <u>1'</u></p> <p>Depth to bottom of well (ft.) <u>21.2' BT6C</u></p> <p>Depth to water surface (ft.) <u>6.4' BT6C</u></p> <p>Length of water (ft.) <u>14.8'</u></p> <p>Volume of water (ft<sup>3</sup>) <u>~2.4</u></p> <p>(gal.)</p> <p>Amount of sediment at bottom of well (ft.)</p> <p>LNAPL (ft.) DNAPL (ft.)</p>	<p><b>PURGING</b></p> <p>Time started <u>1750</u> Finished <u>1800</u></p> <p>Volume purged <u>10 gals</u></p> <p>Comments on Well Recovery <u>Immediate</u></p> <p>Additional Comments</p> <p>Samples Collected: Start <u>1812 1835</u>  <u>PHL 8-13-93</u>  Finish <u>1825 1845</u></p>
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IN-SITU TESTING	Date:	8-13-93	8-13-93	8-13-93	8-13-93	8-13-93	8-13-93
	Time:	<u>1750</u>	<u>1752</u>	<u>1754</u>	<u>1757</u>	<u>1800</u>	<u>1835</u>
Water Level		<u>6.4'</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>6.65</u>	<u>6.45</u>
Well Volume Purged (gal.)		<u>-0-</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>	<u>10</u>	<u>-</u>
Turbidity		<u>none</u>	<u>sl.</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>
Odor		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)		<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)		<u>7.69</u>	<u>7.90</u>	<u>7.69</u>	<u>7.55</u>	<u>7.54</u>	<u>7.79</u>
Conductivity (µ mhos)		<u>149</u>	<u>198</u>	<u>197</u>	<u>203</u>	<u>193</u>	<u>210</u>
Water Temperature (°C)		<u>20.1</u>	<u>26.7</u>	<u>25.4</u>	<u>24.9</u>	<u>24.6</u>	<u>27.6</u>

Notes: 1 ft. length of 4" = 0.037 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.

Turbidity choices: clear, turbid, opaque

Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Resample

Sample ID: PO5MW24W4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931800-12</u>		DATE: <u>8/24/93</u>	
WELL NO. <u>MW2</u>		LOCATION <u>Site 5</u>			
WEATHER CONDITIONS <u>Sunny, breezy, warm</u>		AMBIENT TEMP: <u>~ 75 °F</u>			
PERSONNEL <u>P. Lay + J Smith</u>					
REVIEWED BY: <u>DFT</u>					
EQUIPMENT USED: <u>Pump &amp; hose, teflon bailer</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>peristaltic</u>			Type Device? <u>teflon bailer</u>		
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>		
How was the line decontaminated? <u>its new</u>			How was the line decontaminated? <u>its new</u>		
Which well was previously purged? <u>Site 5, MW4</u>			Which well was previously sampled? <u>PO5MW46W4</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1900</u> Finished <u>1925</u>		
Stickup (ft.) <u>~2 ft</u>			Volume purged <u>7 gal</u>		
Depth to bottom of well (ft.) <u>BTL 21.2</u>			Comments on Well Recovery <u>None</u>		
Depth to water surface (ft.) <u>6.57</u>			Additional Comments <u>None</u>		
Length of water (ft.) <u>14.63</u>					
Volume of water (ft <sup>3</sup> ) <u>0.32</u>					
(gal.) <u>2.3</u>					
Amount of sediment at bottom of well (ft.) <u>NM</u>			Samples Collected: Start <u>1925</u>		
LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>			Finish <u>1936</u>		
IN-SITU TESTING					
Date:	<u>8/24/93</u>				
Time:	<u>1900</u>	<u>1909</u>	<u>1918</u>	<u>1924</u>	<u>1928</u>
Water Level (ft. BTL)	<u>6.57</u>	<u>6.92</u>	<u>7.07</u>	<u>NM</u>	<u>6.71</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2.5</u>	<u>5</u>	<u>7</u>	<u>7</u>
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>
Odor	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>7.40</u>	<u>7.18</u>	<u>7.08</u>	<u>7.08</u>	<u>7.22</u>
Conductivity (µ mhos)	<u>141</u>	<u>145</u>	<u>152</u>	<u>153</u>	<u>149</u>
Water Temperature (°C)	<u>71.1</u>	<u>65.5</u>	<u>64.8</u>	<u>64.2</u>	<u>64.1</u>
<div style="display: flex; justify-content: space-between;"> <div> <p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal</p> <p>Turbidity choices: clear, turbid, opaque</p> </div> <div> <p>1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Revision Date: 2-8-91</p> </div> </div>					

TETC:54

NM = not measured

G-60

2.3 gal  
x 3

6.9 gallons min

FIGURE 3-2



# GROUNDWATER SAMPLING

Sample ID: PSMW36W4

PROJECT NAME Phelps Collins RT JOB NO: 231500-12 DATE: 8-13-93  
 WELL NO. MW3 LOCATION \_\_\_\_\_  
 WEATHER CONDITIONS Sunny, warm, hazy AMBIENT TEMP: -75°F  
 PERSONNEL PHL  
 REVIEWED BY: DFJ

EQUIPMENT USED: Pump, Bailer, hose, filter

## PURGING DEVICE

Type Device? 600 pump 2  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? See logbook  
 Which well was previously purged? P4 MW5

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P4 MW4

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) 22.47 BTDC  
 Depth to water surface (ft.) 8.07 BTDC  
 Length of water (ft.) 14.4  
 Volume of water (ft<sup>3</sup>) ~2.3  
 (gal.) \_\_\_\_\_  
 Amount of sediment at bottom of well (ft.) \_\_\_\_\_  
 LNAPL (ft.) \_\_\_\_\_ DNAPL (ft.) \_\_\_\_\_

## PURGING

Time started 1055 Finished 1144  
 Volume purged 11 gal  
 Comments on Well Recovery Moderate to Immediate  
 Additional Comments \_\_\_\_\_  
 Samples Collected: Start 1145 Finish 1152

IN-SITU TESTING	Date: <u>8-12-93</u>	<u>8-13-93</u>	<u>8-13-93</u>	<u>8-13-93</u>	<u>8-13-93</u>	<u>8-13-93</u>
Time: <u>1152</u>	<u>1108</u>	<u>1115</u>	<u>1126</u>	<u>1135</u>	<u>1145</u>	<u>1152</u>
Water Level	<u>8.07</u>				<u>8.35</u>	<u>8.35</u>
Well Volume Purged (gal.)	<u>-0-</u>	<u>2 1/2 g</u>	<u>5 g</u>	<u>7.5 g</u>	<u>10 g</u>	<u>-0-</u>
Turbidity	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)	<u>7.68</u>	<u>8.12</u>	<u>8.16</u>	<u>8.22</u>	<u>8.21</u>	<u>8.18</u>
Conductivity (μ mhos)	<u>263</u>	<u>272</u>	<u>266</u>	<u>268</u>	<u>259</u>	<u>267</u>
Water Temperature (°C)	<u>72.5</u>	<u>68.5</u>	<u>65.6</u>	<u>66.4</u>	<u>66.4</u>	<u>66.4</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P5MW4GW4

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-13-93</u>		
WELL NO. <u>MW4</u>		LOCATION <u>Site 5</u>				
WEATHER CONDITIONS <u>Sunny, hot, hazy</u>		AMBIENT TEMP: <u>82°F</u>				
PERSONNEL <u>PHC ag, MS Blizard</u>						
REVIEWED BY: <u>DET</u>						
EQUIPMENT USED: <u>Bailer, pump assembly, Filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>P5MW3GW4</u>			Which well was previously sampled? <u>P5MW3GW4</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>1708</u> Finished <u>1730</u>			
Stickup (ft.) <u>2'</u>			Volume purged <u>10</u>			
Depth to bottom of well (ft.) <u>23.65' BTOC</u>			Comments on Well Recovery <u>Immediate</u>			
Depth to water surface (ft.) <u>8.1' BTOC</u>			Additional Comments _____			
Length of water (ft.) <u>15.55'</u>			_____			
Volume of water (ft <sup>3</sup> ) _____			Sample Collected: Start <u>1812</u>			
(gal.) <u>~ 2.5</u>			Finish <u>1825</u>			
Amount of sediment at bottom of well (ft.) _____			_____			
LNAPL (ft.) _____ DNAPL (ft.) _____			_____			
IN-SITU TESTING	Date:	<u>8-13-93</u>	<u>8-13-93</u>	<u>8-13-93</u>	<u>8-13-93</u>	<u>8-13-93</u>
	Time:	<u>1708</u>	<u>1720</u>	<u>1724</u>	<u>1726</u>	<u>1729</u>
Water Level		<u>8.1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>8.35</u>
Well Volume Purged (gal.)		<u>-0-</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>	<u>10</u>
Turbidity		<u>none</u>	<u>SL</u>	<u>Moderate</u>	<u>mod</u>	<u>mod</u>
Odor		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)		<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)		<u>7.59</u>	<u>7.65</u>	<u>8.04</u>	<u>7.86</u>	<u>7.75</u>
Conductivity (µ mhos)		<u>173</u>	<u>194</u>	<u>208</u>	<u>208</u>	<u>206</u>
Water Temperature (°C)		<u>22.7</u>	<u>20.3</u>	<u>69.8</u>	<u>67.7</u>	<u>67.5</u>
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.</p> <p>Turbidity choices: clear, turbid, opaque. Revision Date: 2-8-91</p>						

TETC:154

# GROUNDWATER SAMPLING

Resample

Sample ID: P5MW4GW4

PROJECT NAME <u>Phelps Collins R1</u>		JOB NO: <u>93180012</u>		DATE: <u>8/24/93</u>	
WELL NO. <u>MW4</u>		LOCATION <u>Site 5</u>			
WEATHER CONDITIONS <u>Sunny, breezy, 80°F</u>		AMBIENT TEMP: <u>~80°F</u>			
PERSONNEL <u>P. Lay - J. Smith</u>					
REVIEWED BY: <u>DEFJ</u>					
EQUIPMENT USED: <u>pump, bailer, filter, hose</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>peristaltic</u>			Type Device? <u>bailer (Hogdon)</u>		
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>see logbook</u>		
How was the line decontaminated? <u>new</u>			How was the line decontaminated? <u>new</u>		
Which well was previously purged? <u>MW3 Sites</u>			Which well was previously sampled? <u>MW3 Sites</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1604</u> Finished <u>1635</u>		
Stickup (ft.) <u>~2'</u>			Volume purged <u>10 gal</u>		
Depth to bottom of well (ft.) BTDC <u>23.65</u>			Comments on Well Recovery <u>NM</u>		
Depth to water surface (ft.) BTDC <u>8.25</u>			Additional Comments <u>NM</u>		
Length of water (ft.) <u>15.4</u>			Sample Collected: Start <u>1610</u>		
Volume of water (ft <sup>3</sup> ) <u>0.3388</u>			Finish <u>1656</u>		
(gal.) <u>2.5 gal</u>					
Amount of sediment at bottom of well (ft.) <u>NM</u>					
LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>					
IN-SITU TESTING					
Date:	<u>8/24/93</u>				
Time:	<u>1604</u>	<u>1613</u>	<u>1619</u>	<u>1629</u>	<u>1634</u>
Water Level ft BTDC	<u>8.25</u>	<u>8.46</u>	<u>8.45</u>	<u>8.47</u>	<u>8.46</u>
Well Volume Purged (gal.)	<u>0</u>	<u>25</u>	<u>5</u>	<u>7.5</u>	<u>9</u>
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>7.61</u>	<u>7.01</u>	<u>7.32</u>	<u>7.14</u>	<u>7.06</u>
Conductivity (µ mhos)	<u>184</u>	<u>167</u>	<u>228</u>	<u>180</u>	<u>181</u>
Water Temperature (°F)	<u>74.6</u>	<u>71.5</u>	<u>70.4</u>	<u>70.5</u>	<u>70.6</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal.					
Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91					

TETC154

stop pumping @ 1440 collect metals

G-63

NM = not measured  
 NA = not applicable  
 FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P5MW5GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/29/93  
 WELL NO. 5 LOCATION Sik 5  
 WEATHER CONDITIONS cloudy, breezy, dry AMBIENT TEMP: 70°F  
 PERSONNEL J. Smith & M. Stoker  
 REVIEWED BY: DEF

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? see logbook  
 How was the line decontaminated? see logbook  
 Which well was previously purged? Sik 8 MW4

SAMPLING DEVICE for metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? potable + alconox → potable → DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P5MW4GW4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BTOC 15.5'  
 Depth to water surface (ft.) BTOC 6.32  
 Length of water (ft.) 9.18  
 Volume of water (ft<sup>3</sup>) 0.2  
 (gal.) 1.5  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1348 Finished 1404  
 Volume purged 7 gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 1404  
1410 sample time Finish 1416

IN-SITU TESTING	Date: <u>8/29/93</u>	<u>8/29/93</u>	<u>8/29/93</u>	<u>8/29/93</u>	<u>8/29/93</u>		
	Time: <u>1348</u>	<u>1353</u>	<u>1358</u>	<u>1403</u>	<u>1416</u>		
Water Level # <u>BTOC</u>	<u>6.57</u>	<u>6.67</u>	<u>6.68</u>	<u>6.68</u>	<u>6.65</u>		
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>		
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>turbid</u>		
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>		
Organic Vapor (ppm)	<u>NM</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>		
pH (units)	<u>7.28</u>	<u>6.70</u>	<u>6.93</u>	<u>6.96</u>	<u>7.13</u>		
Conductivity (µ mhos)	<u>648</u>	<u>712</u>	<u>707</u>	<u>687</u>	<u>688</u>		
Water Temperature (°F)	<u>70.8</u>	<u>68.7</u>	<u>68.9</u>	<u>68.5</u>	<u>68.3</u>		

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-64

BTOC = Below Top of (PVC ~~outer steel~~) casing  
8/29/93

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P5MW6GW4

PROJECT NAME <u>Phelps Collins R1</u>		JOB NO: <u>931800-12</u>		DATE: <u>8/29/93</u>	
WELL NO. <u>MW6</u>		LOCATION <u>Site 5</u>			
WEATHER CONDITIONS <u>cloudy, breezy, dry</u>		AMBIENT TEMP: <u>70°F</u>			
PERSONNEL <u>M. Striker &amp; J. Smith</u>					
REVIEWED BY: <u>DEJ</u>					
EQUIPMENT USED: <u>Peristaltic Pump &amp; disposable polyethylene hose; teflon bailer with disposable nylon cord</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Peristaltic Pump</u>			Type Device? <u>metals → peristaltic pump</u> <u>teflon bailer for VOCs, SVOCs, TPH</u>		
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>potable + alconox → potable</u> <u>DI water → methanol; air dry</u>		
How was the line decontaminated? <u>see logbook</u>			How was the line decontaminated? <u>disposable new nylon cord used each time</u>		
Which well was previously purged? <u>Site 5 MW7</u>			Which well was previously sampled? <u>P5MW7 GW4</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1519</u> Finished <u>1535</u>		
Stickup (ft.) <u>2'</u>			Volume purged <u>7 gallons</u>		
Depth to bottom of well (ft.) BDC <u>15.5</u>			Comments on Well Recovery <u>none</u>		
Depth to water surface (ft.) BDC <u>6.36'</u>			Additional Comments <u>none</u>		
Length of water (ft.) <u>9.14'</u>					
Volume of water (ft <sup>3</sup> ) <u>0.20</u>					
(gal.) <u>1.5</u>					
Amount of sediment at bottom of well (ft.) <u>NM</u>			Samples Collected: Start <u>1535</u>		
LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>			1540 Finish <u>1540</u>		
IN-SITU TESTING Date: <u>8/29/93</u>					
Time: <u>1519</u> <u>1525</u> <u>1530</u> <u>1535</u> <u>1546</u>					
Water Level ft BDC <u>6.75</u> <u>6.80</u> <u>6.81</u> <u>6.83</u> <u>6.80</u>					
Well Volume Purged (gal.) <u>0</u> <u>2</u> <u>4</u> <u>6</u> <u>7</u>					
Turbidity <u>clear</u> <u>clear</u> <u>clear</u> <u>clear</u> <u>turbid</u>					
Odor <u>none</u> <u>none</u> <u>none</u> <u>none</u> <u>none</u>					
Organic Vapor (ppm) <u>NM</u> <u>NM</u> <u>NM</u> <u>NM</u> <u>NM</u>					
pH (units) <u>7.94</u> <u>7.43</u> <u>7.58</u> <u>7.60</u> <u>7.62</u>					
Conductivity (µmhos) <u>308</u> <u>344</u> <u>357</u> <u>360</u> <u>374</u>					
Water Temperature (°F) <u>68.5</u> <u>65.9</u> <u>65.7</u> <u>65.6</u> <u>65.7</u>					
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal					
Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91					

TETC134

NM = Not Measured

G-65

BDC = Below Top of (PVC outer steel) casing  
AS of 26/93

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P5MW7604

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/29/93  
 WELL NO. MW7 LOCATION Site 5  
 WEATHER CONDITIONS cloudy, breezy AMBIENT TEMP: 70 °F  
 PERSONNEL M. Shih + J. Smith  
 REVIEWED BY: PAW

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? see logbook  
 How was the line decontaminated? see logbook  
 Which well was previously purged? Site 5 MWS

SAMPLING DEVICE for metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P5 MWS6W4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BTOC 15.5  
 Depth to water surface (ft.) BTOC 7.24  
 Length of water (ft.) 8.26  
 Volume of water (ft<sup>3</sup>) 0.18  
 (gal.) 1.3  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1429 Finished 1444  
 Volume purged 7 gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 1444 Finish 1456

1.3  
3  
3.9 gal  
min.

IN-SITU TESTING	Date: <u>8/29/93</u>	<u>8/29/93</u>	<u>9/29/93</u>	<u>9/29/93</u>	<u>8/29/93</u>		
	Time: <u>1429</u>	<u>1435</u>	<u>1440</u>	<u>1444</u>	<u>1456</u>		
Water Level ft BTOC	<u>7.33</u>	<u>7.34</u>	<u>7.36</u>	<u>7.36</u>	<u>NM</u>		
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>		
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>turbid</u>		
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>		
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>		
pH (units)	<u>7.20</u>	<u>6.95</u>	<u>7.05</u>	<u>7.00</u>	<u>8.06</u>		
Conductivity (µ mhos)	<u>154</u>	<u>171</u>	<u>184</u>	<u>194</u>	<u>249</u>		
Water Temperature (°F)	<u>66.9</u>	<u>64.7</u>	<u>65.6</u>	<u>65.2</u>	<u>65.7</u>		

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-66

BTOC = Below Top of (PVC) casing  
 HS 8/29/93

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P5mw8Gw4

PROJECT NAME <u>phelps Gillies ANG</u>		JOB NO: _____		DATE: <u>9/13/93</u>	
WELL NO. <u>mw8</u>		LOCATION <u>Site 5 2nd FTA</u>			
WEATHER CONDITIONS <u>Windy Sunny</u>		AMBIENT TEMP: <u>~70°F</u>			
PERSONNEL <u>PHLay + BEN</u>					
REVIEWED BY: <u>DET</u>					
EQUIPMENT USED: <u>Pump, Bailer, hose rope, Filter</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Pump</u>			Type Device? <u>Bailer</u>		
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>		
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>		
Which well was previously purged? <u>P3mw7</u>			Which well was previously sampled? <u>P3mw7</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1114</u> Finished <u>1200</u>		
Stickup (ft.) <u>2'</u>			Volume purged <u>12</u>		
Depth to bottom of well (ft.) <u>22' BTOC</u>			Comments on Well Recovery <u>Immediate</u>		
Depth to water surface (ft.) <u>7.1' BTOC</u>			Additional Comments _____		
Length of water (ft.) <u>14.9'</u>			_____		
Volume of water (ft <sup>3</sup> ) <u>0.327</u>			_____		
(gal.) <u>2.38</u>			_____		
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>1205</u>		
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>1220</u>		
IN-SITU TESTING					
Date:	<u>9/13/93</u>	_____	_____	_____	_____
Time:	<u>1114</u>	<u>1124</u>	<u>1035</u>	<u>1145</u>	<u>1200</u>
Water Level	<u>7.1</u>	<u>7.33</u>	_____	_____	<u>7.38</u>
Well Volume Purged (gal.)	<u>initial</u>	<u>9</u>	<u>6</u>	<u>9</u>	<u>12</u>
Turbidity	<u>none</u>	<u>SL</u>	<u>SL</u>	<u>SL</u>	<u>SL</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>SL</u>
Organic Vapor (ppm)	_____	_____	_____	_____	_____
pH (units)	<u>9.44</u>	<u>9.84</u>	<u>9.38</u>	<u>10.02</u>	<u>See logbook</u>
Conductivity ( $\mu$ mhos)	_____	_____	_____	_____	_____
Water Temperature (°C)	<u>66.5</u>	<u>64.2</u>	<u>62.7</u>	<u>62.5</u>	<u>62.4</u>
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91</p>					

# GROUNDWATER SAMPLING

Sample ID: PSmw96w4

PROJECT NAME Phelps Collins AWG RT JOB NO: 931800-12 DATE: 9/13/93  
 WELL NO. rw9 LOCATION Site 5  
 WEATHER CONDITIONS Hot AMBIENT TEMP: 75°F  
 PERSONNEL PHL + DJJ  
 REVIEWED BY: DJJ

EQUIPMENT USED: \_\_\_\_\_

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? PSmw8

## SAMPLING DEVICE

Type Device? Baker  
 How was the device decontaminated? Dedicated from purge  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? PSmw5

## INITIAL WELL VOLUME

Well diameter (In.) 2"  
 Stickup (ft.) 2'  
 Depth to bottom of well (ft.) 20.6  
 Depth to water surface (ft.) 7.36  
 Length of water (ft.) 13.24  
 Volume of water (ft<sup>3</sup>) 0.29  
 (gal.) 2.1  
 Amount of sediment at bottom of well (ft.) —  
 LNAPL (ft.) — DNAPL (ft.) —

## PURGING

Time started 1114 Finished 1156  
 Volume purged 11  
 Comments on Well Recovery Immediate  
 Additional Comments \_\_\_\_\_  
 Samples Collected: Start 1550 Finish 1600

IN-SITU TESTING	Date: <u>9/14/93</u>	<u>9/14/93</u>	<u>9/14/93</u>				
	Time: <u>1140</u>	<u>1143</u>	<u>1150</u>				
Water Level							
Well Volume Purged (gal.)	<u>Initial</u>	<u>5</u>	<u>10</u>				
Turbidity	<u>sl</u>	<u>sl</u>	<u>sl</u>				
Odor	<u>sl</u>	<u>sl</u>	<u>sl</u>				
Organic Vapor (ppm)	<u>—</u>	<u>—</u>	<u>—</u>				
pH (units)	<u>—</u>	<u>See logbook</u>	<u>unable</u>				
Conductivity (μ mhos)	<u>—</u>	<u>See logbook</u>	<u>to calibrate</u>	<u>PH/cond.</u>			
Water Temperature (°C)	<u>64.6</u>	<u>64.5</u>	<u>63.2</u>				

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

LF6MW1

Sample ID: PO6GMW1

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931800-12</u>	DATE: <u>8-11-93</u>
WELL NO. <u>MW1</u>		LOCATION <u>Site 6/7</u>	
WEATHER CONDITIONS <u>warm hazy humid</u>		AMBIENT TEMP: <u>~82°F</u>	
PERSONNEL <u>PHC and MS Stokes</u>			
REVIEWED BY: <u>JS Bruegel 9/21/93</u>			
EQUIPMENT USED: <u>peristaltic pump, bailer, dedicated rope</u>			
<b>PURGING DEVICE</b> Type Device? <u>GEO pump 2</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously purged? <u>PO6GMW2</u>		<b>SAMPLING DEVICE</b> Type Device? <u>Pump/Bailer</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously sampled? _____	
<b>INITIAL WELL VOLUME</b> Well diameter (in.) <u>2"</u> Stickup (ft.) <u>2'</u> Depth to bottom of well (ft.) <u>36.05 BTOC</u> Depth to water surface (ft.) <u>18.59 BTOC</u> Length of water (ft.) <u>17.46</u> Volume of water (ft <sup>3</sup> ) _____ (gal.) <u>~2.8</u> Amount of sediment at bottom of well (ft.) _____ LNAPL (ft.) _____ DNAPL (ft.) _____		<b>PURGING</b> Time started <u>1900</u> Finished <u>1955</u> <del>1920</del> PHL 8-11-93 Volume purged <u>11 gals.</u> Comments on Well Recovery <u>Immediate</u> Additional Comments _____ Samples Collected: Start <u>2006</u> Finish <u>2025</u>	
<b>IN-SITU TESTING</b> Date: <u>8-11-93</u> <u>8-11-93</u> <u>8-11-93</u> <u>8-11-93</u> <u>8-11-93</u> <u>8-11-93</u> Time: <u>1900</u> <u>1921</u> <u>1951</u> <u>1940</u> <u>1950</u> <u>2006</u> <del>8-11-93 PHL</del> <del>18.49 18.59</del>			
Water Level		<u>18.62</u>	
Well Volume Purged (gal.)		<u>-0-</u> <u>2.5</u> <u>5</u> <u>7.5</u> <u>10</u> <u>-</u>	
Turbidity		<u>SL</u> <u>-</u> <u>none</u> <u>none</u> <u>none</u> <u>none</u>	
Odor		<u>None</u> <u>none</u> <u>none</u> <u>none</u> <u>none</u> <u>none</u>	
Organic Vapor (ppm)		<u>-0-</u> <u>-0-</u> <u>-0-</u> <u>-0-</u> <u>-0-</u> <u>-0-</u>	
pH (units)		<u>10.52</u> <u>9.44</u> <u>9.28</u> <u>9.43</u> <u>9.16</u> <u>9.26</u>	
Conductivity (µ mhos)		<u>185</u> <u>203</u> <u>233</u> <u>235</u> <u>243</u> <u>241</u>	
Water Temperature (°C)		<u>60.2</u> <u>58.1</u> <u>58.1</u> <u>57.8</u> <u>57.9</u> <u>57.8</u>	
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal. Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91			

TETC154

# GROUNDWATER SAMPLING

LF6MW2

Sample ID: P06Gmw2

PROJECT NAME <u>Phelps Collins</u>		JOB NO: <u>931800-12</u>	DATE: <u>8-11-93</u>																																																																																
WELL NO. <u>MW2</u>	LOCATION <u>Site 6</u>																																																																																		
WEATHER CONDITIONS <u>hazy humid overcast</u> AMBIENT TEMP: <u>78-82°F</u>																																																																																			
PERSONNEL <u>PA Lay and ME Stoker</u>																																																																																			
REVIEWED BY: <u>JS Smegel 9/21/93</u>																																																																																			
EQUIPMENT USED: <u>Pump, hose, Bailer, pump assembly</u>																																																																																			
<b>PURGING DEVICE</b> Type Device? <u>Bailer Geopung 2</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously purged? <u>P04GMW2</u>		<b>SAMPLING DEVICE</b> Type Device? <u>Bailer/Pump</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously sampled? <u>P04GMW2</u>																																																																																	
<b>INITIAL WELL VOLUME</b> Well diameter (in.) <u>2"</u> Slickup (ft.) <u>2'</u> Depth to bottom of well (ft.) <u>28.2' BTOC</u> Depth to water surface (ft.) <u>12.59' BTOC</u> Length of water (ft.) <u>15.61'</u> Volume of water (ft <sup>3</sup> ) <u>~ 2.5</u> (gal.) Amount of sediment at bottom of well (ft.) <u>—</u> LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>		<b>PURGING</b> Time started <u>1540</u> Finished <u>1620</u> Volume purged <u>~ 12 gal</u> Comments on Well Recovery <u>immediat</u> Additional Comments Samples Collected: Start <u>1620</u> Finish <u>1629</u>																																																																																	
<b>IN-SITU TESTING</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Date:</th> <th><u>8-11-93</u></th> <th><u>8-11-93</u></th> <th><u>8-11-93</u></th> <th><u>8-11-93</u></th> <th><u>8-11-93</u></th> <th><u>8-11-93</u></th> <th><u>8-11-93</u></th> </tr> </thead> <tbody> <tr> <td>Time:</td> <td><u>1540</u></td> <td><u>15:50</u></td> <td><u>15:58</u></td> <td><u>16:06</u></td> <td><u>16:12</u></td> <td><u>16:20</u></td> <td><u>16:29</u></td> </tr> <tr> <td>Water Level</td> <td><u>12.59'</u></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><u>12.62'</u></td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>-0-</u></td> <td><u>2</u></td> <td><u>4</u></td> <td><u>6</u></td> <td><u>8</u></td> <td><u>10</u></td> <td><u>Final ~ 12</u></td> </tr> <tr> <td>Turbidity</td> <td><u>slt none</u></td> <td><u>5/</u></td> <td><u>5/</u></td> <td><u>5/</u></td> <td><u>5/</u></td> <td><u>5/</u></td> <td><u>5/</u></td> </tr> <tr> <td>Odor</td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> </tr> <tr> <td>pH (units)</td> <td><u>11.87</u></td> <td><u>7.84</u></td> <td><u>8.12</u></td> <td><u>8.36</u></td> <td><u>8.52</u></td> <td><u>8.59</u></td> <td><u>8.54</u></td> </tr> <tr> <td>Conductivity (μ mhos)</td> <td><u>278</u></td> <td><u>209</u></td> <td><u>294</u></td> <td><u>319</u></td> <td><u>301</u></td> <td><u>312</u></td> <td><u>308</u></td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>16.8</u></td> <td><u>62.6</u></td> <td><u>59.6</u></td> <td><u>58.9</u></td> <td><u>59.9</u></td> <td><u>59.6</u></td> <td><u>59.8</u></td> </tr> </tbody> </table>				Date:	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	Time:	<u>1540</u>	<u>15:50</u>	<u>15:58</u>	<u>16:06</u>	<u>16:12</u>	<u>16:20</u>	<u>16:29</u>	Water Level	<u>12.59'</u>						<u>12.62'</u>	Well Volume Purged (gal.)	<u>-0-</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>10</u>	<u>Final ~ 12</u>	Turbidity	<u>slt none</u>	<u>5/</u>	<u>5/</u>	<u>5/</u>	<u>5/</u>	<u>5/</u>	<u>5/</u>	Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	pH (units)	<u>11.87</u>	<u>7.84</u>	<u>8.12</u>	<u>8.36</u>	<u>8.52</u>	<u>8.59</u>	<u>8.54</u>	Conductivity (μ mhos)	<u>278</u>	<u>209</u>	<u>294</u>	<u>319</u>	<u>301</u>	<u>312</u>	<u>308</u>	Water Temperature (°C)	<u>16.8</u>	<u>62.6</u>	<u>59.6</u>	<u>58.9</u>	<u>59.9</u>	<u>59.6</u>	<u>59.8</u>
Date:	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>																																																																												
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Well Volume Purged (gal.)	<u>-0-</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>10</u>	<u>Final ~ 12</u>																																																																												
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Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>																																																																												
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>																																																																												
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Water Temperature (°C)	<u>16.8</u>	<u>62.6</u>	<u>59.6</u>	<u>58.9</u>	<u>59.9</u>	<u>59.6</u>	<u>59.8</u>																																																																												
Notes: 1 ft. length of 4" = 0.057 ft <sup>3</sup> or 0.65 gal Turbidity choices: clear, turbid, opaque 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal Revision Date: 2-8-91																																																																																			

TETC154

LF6MW3

The Earth Technology Corporation

# GROUNDWATER SAMPLING

Sample ID: P6MW3GW4

PROJECT NAME Phelps Collins R1 JOB NO: 931800-12 DATE: 8/26/93  
 WELL NO. MW3 LOCATION Site 6  
 WEATHER CONDITIONS P. cloudy, humid, calm AMBIENT TEMP: ~80°F  
 PERSONNEL J. Smith & P. Lay  
 REVIEWED BY: J. Bruegel 9/21/93

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? see logbook  
 How was the line decontaminated? see logbook  
 Which well was previously purged? Site 3 MW5

SAMPLING DEVICE formetals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? D3 MW5 GW4 + P3 MW9 GW4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BTOC 39.95 JSS 12/13  
 Depth to water surface (ft.) BTOC 15.16  
 Length of water (ft.) 24.49  
 Volume of water (ft<sup>3</sup>) 10.54  
 (gal.) 3.97  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1331 Finished 1421  
 Volume purged 14 gallons  
 Comments on Well Recovery \_\_\_\_\_  
 Additional Comments pH meter is drifting; pH readings are suspect.  
 Samples Collected: Start 1422  
 1430 on sample 1445 on sample 1450 on sample 1455 on sample 1458 on sample  
 Finish 1432

IN-SITU TESTING	Date: <u>8/26/93</u>						
Time:	<u>1331</u>	<u>1345</u>	<u>1400</u>	<u>1416</u>	<u>1421</u>	<u>1432</u>	
Water Level if BTOC	<u>15.97</u>	<u>16.04</u>	<u>16.06</u>	<u>16.04</u>	<u>15.66</u>	<u>NM</u>	
Well Volume Purged (gal.)	<u>0</u>	<u>4</u>	<u>12</u>	<u>12</u>	<u>14</u>	<u>14</u>	
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	
Odor	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	
pH (units)	<u>7.69</u>	<u>9.63</u>	<u>9.56</u>	<u>10.40</u>	<u>11.69</u>	<u>11.69</u>	
Conductivity (µ mhos)	<u>349</u>	<u>294</u>	<u>3.02</u>	<u>396</u>	<u>362</u>	<u>362</u>	
Water Temperature (°F)	<u>76.3</u>	<u>62.1</u>	<u>59.9</u>	<u>65.2</u>	<u>59.5</u>	<u>59.5</u>	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-71

BTOC = Below Top of (Outer steel) Casing

FIGURE 3-2

4  
4  
16 gal  
12 total  
see purging comments above

LFLMW4

The Earth Technology Corporation

## GROUNDWATER SAMPLING

Sample ID: P6MW4GW4

PROJECT NAME <u>Phelps Collins R1</u>		JOB NO: <u>931800-12</u>		DATE: <u>8/30/93</u>	
WELL NO. <u>MW4</u>		LOCATION <u>Site 6</u>			
WEATHER CONDITIONS <u>cloudy, sl. breezy, abn. rain</u>		AMBIENT TEMP: <u>60 °F</u>			
PERSONNEL <u>Smith &amp; M. Stiles</u>					
REVIEWED BY: <u>J. S. Buegel 9/21/93</u>					
EQUIPMENT USED: <u>Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Peristaltic Pump</u>			Type Device? <u>formetals → peristaltic pump</u> <u>teflon bailer for VOCs, SVOCs, TPH</u>		
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>potable + alconox → potable</u> <u>DI water → methanol; air dry</u>		
How was the line decontaminated? <u>See logbook</u>			How was the line decontaminated? <u>disposable new nylon</u> <u>cord used each time</u>		
Which well was previously purged? <u>Site 6 MW5</u>			Which well was previously sampled? <u>P6MW5 GW4</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>0906</u> Finished <u>0930</u>		
Stickup (ft.) <u>~2'</u>			Volume purged <u>5</u> gallons		
Depth to bottom of well (ft.) <u>BTOC ~20</u>			Comments on Well Recovery		
Depth to water surface (ft.) <u>BTOC 12.05</u>			Additional Comments		
Length of water (ft.) <u>7.95</u>			Sample Collected: Start <u>0930</u>		
Volume of water (ft <sup>3</sup> ) <u>0.17</u>			Finish <u>0935</u>		
(gal.) <u>1.3</u>					
Amount of sediment at bottom of well (ft.) <u>NM</u>					
LNAPL (ft.) <u>NM</u>			DNAPL (ft.) <u>NM</u>		
IN-SITU TESTING					
Date:	<u>8/30/93</u>	<u>09/01/93</u>	<u>09/08/93</u>	<u>09/15/93</u>	<u>09/22/93</u>
Time:	<u>0906</u>	<u>0912</u>	<u>0918</u>	<u>0924</u>	<u>0930</u>
Water Level ft. BTOC	<u>12.28</u>	<u>12.63</u>	<u>12.70</u>	<u>12.71</u>	<u>12.72</u>
Well Volume Purged (gal.)	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Turbidity	<u>clear</u>	<u>cl</u>	<u>cl</u>	<u>cl</u>	<u>cl</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>8.49</u>	<u>7.98</u>	<u>7.94</u>	<u>7.92</u>	<u>7.93</u>
Conductivity (µmhos)	<u>371</u>	<u>374</u>	<u>378</u>	<u>384</u>	<u>382</u>
Water Temperature (°F)	<u>60.4</u>	<u>59.3</u>	<u>58.9</u>	<u>59.1</u>	<u>59.0</u>
Notes: 1 ft. length of 4" = 0.007 ft <sup>3</sup> or 0.05 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal.					
Turbidity choices: clear, turbid, opaque					
Revision Date: 2-8-91					

TETC154

NM = Not Measured

G-72

BTOC = Below Top of (Outer steel) casing

FIGURE 3-2

LF6 MW 5

The Earth Technology Corporation

## GROUNDWATER SAMPLING

Sample ID: P6MW5GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/30/93

WELL NO. MW5 LOCATION Site 6

WEATHER CONDITIONS Cloudy, slightly breezy AMBIENT TEMP: 65°F

PERSONNEL J. Smith M. Stulen

REVIEWED BY: J. P. Megeel 2/21/93

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE

Type Device? Peristaltic Pump

How was the device decontaminated? See logbook

How was the line decontaminated? See logbook

Which well was previously purged? Site 5 MW6

SAMPLING DEVICE for metals → peristaltic pump

Type Device? teflon bailer for VOCs, SVOCs, TPH

How was the device decontaminated? potable + alconox → potable → DI water → methanol; air dry

How was the line decontaminated? disposable new nylon cord used each time

Which well was previously sampled? P5 MW6 GW4

INITIAL WELL VOLUME

Well diameter (in.) 2"

Stickup (ft.) ~2'

Depth to bottom of well (ft.) BDC ~20

Depth to water surface (ft.) BDC 10.82 + 18.5 = 29.32

Length of water (ft.) 9.18

Volume of water (ft<sup>3</sup>) 0.2

(gal.) 1.5

Amount of sediment at bottom of well (ft.) NM

LNAPL (ft.) NM DNAPL (ft.) NM

PURGING

Time started 0816 Finished 0837

Volume purged 7 gallons

Comments on Well Recovery Recovery to ~90% within 1 minute

Additional Comments none

Samples Collected: Start 0837 Finish 0852

840 Sample time

IN-SITU TESTING	Date: <u>8/30/93</u>				
	Time: <u>0815</u>	<u>0821</u>	<u>0829</u>	<u>0837</u>	<u>0852</u>
Water Level ft BDC	<u>11.20</u>	<u>11.22</u>	<u>11.26</u>	<u>11.26</u>	<u>10.92</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>slightly turbid</u>
Odor	<u>NM</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NM</u>
pH (units)	<u>7.54</u>	<u>7.76</u>	<u>7.36</u>	<u>7.36</u>	<u>8.10</u>
Conductivity (μ mhos)	<u>232</u>	<u>236</u>	<u>244</u>	<u>238</u>	<u>261</u>
Water Temperature (°F)	<u>65.5</u>	<u>62.5</u>	<u>62.2</u>	<u>62.4</u>	<u>63.2</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC:154

NM = Not Measured

G-73

at N - Re Purge Tool (After steel casing)

PVC 1/2" ID

FIGURE 3-2

LF6 MW 6

The Earth Technology Corporation

## GROUNDWATER SAMPLING

Sample ID: P6MW6GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/30/93  
 WELL NO. NW6 LOCATION Site 6 in woods  
 WEATHER CONDITIONS cloudy, drizzling, humid AMBIENT TEMP: 65°F  
 PERSONNEL J. Smith & M. Stokes  
 REVIEWED BY: J. Smigel 9/21/93

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

## PURGING DEVICE

Type Device? Peristaltic PumpHow was the device decontaminated? see logbookHow was the line decontaminated? see logbookWhich well was previously purged? Site 6 MW4SAMPLING DEVICE for metals → peristaltic pumpType Device? teflon bailer for VOCs, SVOCs, TPHHow was the device decontaminated? potable + alconox → potable → DI water → methanol; air dryHow was the line decontaminated? disposable new nylon cord used each timeWhich well was previously sampled? P6MW4GW4

## INITIAL WELL VOLUME

Well diameter (in.) 2"Stickup (ft.) ~2'Depth to bottom of well (ft.) BTOC 34.90'Depth to water surface (ft.) BTOC 10.19Length of water (ft.) 18.71'Volume of water (ft<sup>3</sup>) 0.41(gal.) 3.0Amount of sediment at bottom of well (ft.) NMLNAPL (ft.) NM DNAPL (ft.) NM

## PURGING

Time started 1134 Finished 1215Volume purged 11 gallonsComments on Well Recovery noneAdditional Comments noneSamples Collected: Start 1215Finish 1229

## IN-SITU TESTING

Date: 8/30/93Time: 1134Water Level # BTOC NM 1148 1158 1205 1210 1215 1229Well Volume Purged (gal.) 0 2 4 6 8 10.8 11.3 11.9Turbidity clear clear clear clear clear CI CI CIOdor none none none none none none none noneOrganic Vapor (ppm) NM NM NM NM NM NM NM NMpH (units) \* \* \* \* \* \* \* \*Conductivity ( $\mu$  mhos) 442 419 419 438 445 434 428 428Water Temperature ( $^{\circ}$ F) 61.3 55.2 55.3 56.7 55.6 55.8 55.5 55.5

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-74

BTOC = Below Top of (PVC Outer Steel) Casing

+ pH meter is broken.

FIGURE 3-2

# GROUNDWATER SAMPLING

LF6 MW 8

Sample ID: PL6MW8GW9

PROJECT NAME Phelps Collins ANG RI JOB NO: 931500-12 DATE: 9/8/93  
 WELL NO. nw8 LOCATION Site 6 old Land Fill  
 WEATHER CONDITIONS cool AMBIENT TEMP: ~68°  
 PERSONNEL PHCay and BFNorton  
 REVIEWED BY: JSAmegel 9/21/93

EQUIPMENT USED: Bailer, pump assembly, filter

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? P9mw4

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P9mw4

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) 2'  
 Depth to bottom of well (ft.) 15' BTOC  
 Depth to water surface (ft.) 11.89 BTOC  
 Length of water (ft.) 3.11  
 Volume of water (ft<sup>3</sup>) 0.068  
 (gal.) 0.5  
 Amount of sediment at bottom of well (ft.) —  
 LNAPL (ft.) — DNAPL (ft.) —

## PURGING

Time started 1313 Finished 1324  
 Volume purged 3  
 Comments on Well Recovery Slow  
 Additional Comments —  
 Samples Collected: Start 1410 Finish 1420

## IN-SITU TESTING

	Date: <u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/9/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	
Time:	<u>1313</u>	<u>1316</u>	<u>1320</u>	<u>1322</u>	<u>1324</u>	<u>1420</u>	
Water Level	<u>11.89'</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>11.88</u>	
Well Volume Purged (gal.)	<u>—</u>	<u>1 gal</u>	<u>2</u>	<u>2.5</u>	<u>3</u>	<u>—</u>	
Turbidity	<u>very</u>	<u>very</u>	<u>very</u>	<u>very</u>	<u>mod</u>	<u>mod</u>	
Odor	<u>Sl.</u>	<u>Sl.</u>	<u>Sl.</u>	<u>Sl.</u>	<u>mod.</u>	<u>mod</u>	
Organic Vapor (ppm)	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
pH (units)	<u>6.81</u>	<u>6.97</u>	<u>6.94</u>	<u>7.16</u>	<u>7.10</u>	<u>7.06</u>	
Conductivity (μ mhos)	<u>343</u>	<u>446</u>	<u>493</u>	<u>462</u>	<u>515</u>	<u>486</u>	
Water Temperature (°C)	<u>64.4</u>	<u>60.8</u>	<u>60.7</u>	<u>60.2</u>	<u>59.5</u>	<u>60.4</u>	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

LF6MW9

Sample ID: Pl6mw9 gw4

PROJECT NAME <u>Phelps Collins ANG RI</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/8/93</u>		
WELL NO. <u>mw9</u>		LOCATION <u>Site 6 Landfill</u>				
WEATHER CONDITIONS <u>Sunny</u>		AMBIENT TEMP: <u>~70</u>				
PERSONNEL <u>PH Lay and BF Noctor</u>						
REVIEWED BY: <u>JSB megal 9/21/93</u>						
EQUIPMENT USED: <u>Bailer, pump assembly, filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>Pl6mw8</u>			Which well was previously sampled? <u>Pl6mw8</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>1330</u> Finished <u>1342</u>			
Stickup (ft.) <u>2'</u>			Volume purged <u>3.5</u>			
Depth to bottom of well (ft.) <u>14.8 BTOL</u>			Comments on Well Recovery <u>Slow</u>			
Depth to water surface (ft.) <u>10.79 BTOL</u>			Additional Comments _____			
Length of water (ft.) <u>4.01</u>			_____			
Volume of water (ft <sup>3</sup> ) <u>0.088</u>			_____			
(gal.) <u>0.65</u>			_____			
Amount of sediment at bottom of well (ft.) <u>—</u>			Samples Collected: Start <u>1440</u>			
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>			Finish <u>1450</u>			
IN-SITU TESTING						
Date:	<u>9/8/93</u>	<u>9/9/93</u>	<u>9/8/93</u>	<u>9/6/93</u>	<u>9/8/93</u>	<u>9/8/93</u>
Time:	<u>1330</u>	<u>1334</u>	<u>1337</u>	<u>1340</u>	<u>1342</u>	<u>1450</u>
Water Level	<u>10.79'</u>					<u>10.79</u>
Well Volume Purged (gal.)	<u>—</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>3.5</u>	<u>—</u>
Turbidity	<u>51</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>
Odor	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Organic Vapor (ppm)	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
pH (units)	<u>7.27</u>	<u>7.45</u>	<u>7.51</u>	<u>7.55</u>	<u>7.57</u>	<u>7.49</u>
Conductivity (µ mhos)	<u>447</u>	<u>465</u>	<u>485</u>	<u>459</u>	<u>499</u>	<u>472</u>
Water Temperature (°C)	<u>59.6</u>	<u>58.4</u>	<u>57.3</u>	<u>57.8</u>	<u>57.2</u>	<u>57.8</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal. Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91						

TETC:54

# GROUNDWATER SAMPLING

Sample ID: 26M106W4

PROJECT NAME Phelps Collins ARG RT JOB NO: 931800-12 DATE: 9/15/13  
 WELL NO. MW10 LOCATION Site 6 LF  
 WEATHER CONDITIONS Cool windy AMBIENT TEMP: 60°F  
 PERSONNEL PHLay & DFT  
 REVIEWED BY: LSR

EQUIPMENT USED: Bailer

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? PMW106

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Acetone + DI, DI rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? \_\_\_\_\_

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) 15  
 Depth to water surface (ft.) 11'  
 Length of water (ft.) 4'  
 Volume of water (ft<sup>3</sup>) 0.088  
 (gal.) 0.64  
 Amount of sediment at bottom of well (ft.) —  
 LNAPL (ft.) — DNAPL (ft.) —

## PURGING

Time started 2025 Finished 2048  
 Volume purged 5 galls  
 Comments on Well Recovery moderate  
 Additional Comments \_\_\_\_\_  
 Samples Collected: Start 0725  
9/16/13 Finish 0730

## IN-SITU TESTING

Date:	9/15/13	9/15/13	9/15/13	_____	_____	_____	_____
Time:	2025	2035	2048	_____	_____	_____	_____
Water Level	<u>4'</u>	<u>—</u>	<u>4.2'</u>	_____	_____	_____	_____
Well Volume Purged (gal.)	<u>0</u>	<u>2.5</u>	<u>5</u>	_____	_____	_____	_____
Turbidity	<u>sl.</u>	<u>mod</u>	<u>very</u>	_____	_____	_____	_____
Odor	<u>biological</u>	<u>—</u>	<u>—</u>	_____	_____	_____	_____
Organic Vapor (ppm)	<u>—</u>	<u>—</u>	<u>—</u>	_____	_____	_____	_____
pH (units)	<u>unable to calibrate</u>	<u>—</u>	<u>—</u>	_____	_____	_____	_____
Conductivity (µ mhos)	<u>pH and Cond</u>	<u>—</u>	<u>—</u>	_____	_____	_____	_____
Water Temperature (°C)	<u>14.4</u>	<u>14.8</u>	<u>14.7</u>	_____	_____	_____	_____

Notes:

1 ft. length of 4"

Turbidity choices:

= 0.087 ft<sup>3</sup> or 0.65 gal.  
 clear, turbid, opaque

1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P3mw16w4

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-15-93</u>		
WELL NO. <u>mw1</u>		LOCATION <u>Site 8, Old Hangar 9</u>				
WEATHER CONDITIONS <u>cool cloudy</u>		AMBIENT TEMP: <u>~70°F</u>				
PERSONNEL <u>PHLug, M. E. Stoker</u>						
REVIEWED BY: <u>RFJ</u>						
EQUIPMENT USED: <u>Pump, hose, Bailor, rope, filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>PAL 1545 Pump</u>			Type Device? <u>Bailor</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>P3mw1</u>			Which well was previously sampled? <u>P3mw1</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>1042</u> Finished <u>1125</u>			
Stickup (ft.) <u>-0.3</u>			Volume purged <u>11 gals</u>			
Depth to bottom of well (ft.) <u>25' BTOC</u>			Comments on Well Recovery <u>immediate</u>			
Depth to water surface (ft.) <u>10.9' BTOC</u>			Additional Comments _____			
Length of water (ft.) <u>14.1'</u>			_____			
Volume of water (ft <sup>3</sup> ) <u>0.3102</u>			_____			
(gal.) <u>~2.25</u>			_____			
Amount of sediment at bottom of well (ft.) <u>—</u>			Samples Collected: Start <u>1126</u>			
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>			Finish <u>1146</u>			
IN-SITU TESTING						
Date:	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>
Time:	<u>1042</u>	<u>1052</u>	<u>1102</u>	<u>1110</u>	<u>1119</u>	<u>1146</u>
Water Level	<u>10.9</u>					<u>11.05</u>
Well Volume Purged (gal.)	<u>-0.</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>	<u>10</u>	<u>-</u>
Turbidity	<u>none</u>	<u>none</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>
Odor	<u>none</u>	<u>none</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>
Organic Vapor (ppm)	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>
pH (units)	<u>8.08</u>	<u>8.05</u>	<u>7.85</u>	<u>7.89</u>	<u>7.83</u>	<u>7.84</u>
Conductivity (µ mhos)	<u>303</u>	<u>330</u>	<u>326</u>	<u>332</u>	<u>333</u>	<u>331</u>
Water Temperature (°C)	<u>63.1</u>	<u>61.2</u>	<u>59.8</u>	<u>60.2</u>	<u>60.1</u>	<u>60.3</u>
Notes: 1 ft. length of 4" = 0.087 m <sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 m <sup>3</sup> or 0.16 gal Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91						

TETC154

# GROUNDWATER SAMPLING

Sample ID: P8MW2QW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/29/93  
 WELL NO. MW2 LOCATION Site 8  
 WEATHER CONDITIONS p cloudy, calm, cool AMBIENT TEMP: 65°F  
 PERSONNEL J. Smith + P. [unclear] M. Skalen  
 REVIEWED BY: DRT

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE Type Device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>see logbook</u> How was the line decontaminated? <u>see logbook</u> Which well was previously purged? <u>Site 9 MW3</u>	SAMPLING DEVICE <u>for metals → peristaltic pump</u> Type Device? <u>teflon bailer for VOCs, SVOCs, TPH</u> How was the device decontaminated? <u>DI water + allonox → DI water → methanol; air dry</u> How was the line decontaminated? <u>disposable new nylon cord used each time</u> Which well was previously sampled? <u>P9 MW3 QW4</u>
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INITIAL WELL VOLUME Well diameter (in.) <u>2"</u> Stickup (ft.) <u>22'</u> Depth to bottom of well (ft.) BDC <u>32.0</u> Depth to water surface (ft.) BDC <u>17.90</u> Length of water (ft.) <u>14.1</u> Volume of water (ft <sup>3</sup> ) <u>0.31</u> (gal.) <u>2.3 3.3</u> Amount of sediment at bottom of well (ft.) <u>NM</u> LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>	PURGING Time started <u>0818</u> Finished <u>0850</u> Volume purged <u>9 gallons</u> Comments on Well Recovery <u>none</u> Additional Comments <u>none</u> Samples Collected: Start <u>0850</u> Sample time <u>0900</u> Finish <u>0904</u>
---	--

2.3  
3.3  
6.6

IN-SITU TESTING	Date: <u>8/19/93</u>						
	Time: <u>0821</u>	<u>0831</u>	<u>0836</u>	<u>0844</u>	<u>0850</u>	<u>0904</u>	
Water Level <u>if BDC</u>	<u>17.95</u>	<u>17.94</u>	<u>17.94</u>	<u>17.94</u>	<u>17.94</u>	<u>NM</u>	
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>9</u>	
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	
pH (units)	<u>7.78</u>	<u>7.85</u>	<u>7.91</u>	<u>7.99</u>	<u>7.97</u>	<u>7.90</u>	
Conductivity (μ mhos)	<u>794</u>	<u>392</u>	<u>384</u>	<u>418</u>	<u>410</u>	<u>422</u>	
Water Temperature (°F) <u>8/29/93</u>	<u>60.9</u>	<u>54.8</u>	<u>54.8</u>	<u>54.4</u>	<u>54.6</u>	<u>55.6</u>	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured G-79  
 BDC = Below Top of (PVC outer shell) casing  
8/29/93

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P8MW34W4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/29/93  
 WELL NO. MW3 LOCATION Site 8  
 WEATHER CONDITIONS cloudy, calm, dry AMBIENT TEMP: 60 °F  
 PERSONNEL J. Smith & Mark Stoker  
 REVIEWED BY: DFJ

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? See logbook  
 Which well was previously purged? Site 8 MW2

SAMPLING DEVICE formetals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? DI water → methanol, airdry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P8MW2 GW4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~ 2'  
 Depth to bottom of well (ft.) BTC 32.0  
 Depth to water surface (ft.) BTC 17.88'  
 Length of water (ft.) 14.12  
 Volume of water (ft<sup>3</sup>) 0.31  
 (gal.) 2.3  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 0926 0948 1002  
 Time finished 0948  
 Volume purged 8 gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 0948  
 Sample time 1000 Finish 1002

IN-SITU TESTING	Date: <u>8/29/93</u>					
	Time: <u>0926</u>	<u>0934</u>	<u>0939</u>	<u>0945</u>	<u>0948</u>	<u>1002</u>
Water Level <u>ft BTC</u>	<u>17.91</u>	<u>17.91</u>	<u>17.91</u>	<u>17.91</u>	<u>17.91</u>	<u>NM</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>	<u>8</u>
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>7.84</u>	<u>7.62</u>	<u>7.70</u>	<u>7.65</u>	<u>7.65</u>	<u>8.18</u>
Conductivity ( $\mu$ mhos)	<u>587</u>	<u>543</u>	<u>540</u>	<u>572</u>	<u>564</u>	<u>565</u>
Water Temperature ( $^{\circ}$ F)	<u>58.8</u>	<u>58.8</u>	<u>55.8</u>	<u>55.9</u>	<u>54.9</u>	<u>56.9</u>

Notes: 1 ft. length of 4" = 0.007 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-80

BTC = Below Top of (outer steel) casing  
PVC  
8/29/93

FIGURE 3-2

# GROUNDWATER SAMPLING

Blind Duplicate P8 MW96W4 @ 1230

Sample ID: P8 MW4CWT

@ 1140

PROJECT NAME Phelps Collins R1 JOB NO: 931800-12 DATE: 8/29/93  
 WELL NO. MW4 LOCATION Site 8  
 WEATHER CONDITIONS partly cloudy, calm, dry AMBIENT TEMP: 70°F  
 PERSONNEL J. Smith + P. Edg + M. Stover  
 REVIEWED BY: DFJ

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? see logbook  
 How was the line decontaminated? see logbook  
 Which well was previously purged? Site 8 MW3

SAMPLING DEVICE metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? DI water + alconox → DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P8 MW3 G104

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BTOC 56.5  
 Depth to water surface (ft.) BTOC 18.18  
 Length of water (ft.) 38.32  
 Volume of water (ft<sup>3</sup>) 0.8  
 (gal.) 6.1  
 Amount of sediment at bottom of well (ft.) submit NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1020 Finished 1137  
 Volume purged 22 gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 1137  
 Sample time 1140 Finish 1157

IN-SITU TESTING	Date: <u>8/29/93</u>						
	Time: <u>1020</u>	<u>1043</u>	<u>1052</u>	<u>1105</u>	<u>1121</u>	<u>1136</u>	<u>1157</u>
Water Level <u>ft BTOC</u>	<u>18.24</u>	<u>18.24</u>	<u>18.24</u>	<u>18.25</u>	<u>18.24</u>	<u>18.24</u>	<u>18.18</u>
Well Volume Purged (gal.)	<u>0</u>	<u>4</u>	<u>8</u>	<u>12</u>	<u>16</u>	<u>20</u>	<u>22</u>
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>8.59</u>	<u>8.52</u>	<u>8.24</u>	<u>8.25</u>	<u>8.16</u>	<u>8.48</u>	<u>8.55</u>
Conductivity (μ mhos)	<u>337</u>	<u>320</u>	<u>318</u>	<u>321</u>	<u>319</u>	<u>321</u>	<u>323</u>
Water Temperature (°F)	<u>59.9</u>	<u>57.7</u>	<u>56.1</u>	<u>57.6</u>	<u>58.0</u>	<u>58.4</u>	<u>58.7</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque. Revision Date: 2-8-91

TETC154

NM = Not Measured

G-81

BTOC = Below Top of (Outer steel) Casing

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P8mw56w4

PROJECT NAME <u>Phelps Collins</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/13/93</u> <small>PHL</small>	
WELL NO. <u>mw5</u>		LOCATION <u>Site B</u>			
WEATHER CONDITIONS <u>Rainy</u>		AMBIENT TEMP: <u>~55°F</u>			
PERSONNEL <u>PHLag, DFJager</u>					
REVIEWED BY: <u>DFJ</u>					
EQUIPMENT USED: <u>Bailer rope hand pump assembly, &amp; filter</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Bailer</u>			Type Device? <u>Bailer - See logbook</u> <small>PHL</small>		
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>		
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>		
Which well was previously purged? <u>P5mw9</u>			Which well was previously sampled? _____		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1450</u> Finished <u>1510</u>		
Stickup (ft.) <u>-0.3</u>			Volume purged <u>7 gals</u>		
Depth to bottom of well (ft.) <u>19.55</u>			Comments on Well Recovery <u>immediate</u>		
Depth to water surface (ft.) <u>11.38</u>			Additional Comments _____		
Length of water (ft.) <u>8.17</u>			_____		
Volume of water (ft <sup>3</sup> ) <u>0.18</u>			_____		
(gal.) <u>1.3</u>			_____		
Amount of sediment at bottom of well (ft.) <u>-</u>			Samples Collected: Start <u>11/2</u>		
LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>			9/14/93 Finish <u>1130</u>		
IN-SITU TESTING					
Date:	<u>9/13/93</u>	<u>9/13/93</u>	<u>9/13/93</u>	<u>9/14/93</u>	_____
Time:	<u>1445</u>	<u>1458</u>	<u>1510</u>	<u>1510</u>	_____
Water Level	<u>11.38</u>	_____	<u>11.40</u>	_____	_____
Well Volume Purged (gal.)	<u>0</u>	<u>3.5</u>	<u>7</u>	<u>-</u>	_____
Turbidity	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	_____
Odor	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	_____
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	_____
pH (units)	<u>unable to calibrate</u>				_____
Conductivity (µ mhos)	<u>pH and conductivity</u>				_____
Water Temperature (°C)	<u>63.5</u>	<u>64.2</u>	<u>64.1</u>	<u>64.3</u>	_____
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal. Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91					

TETC154

# GROUNDWATER SAMPLING

Sample ID: P9MW1GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/27/93  
 WELL NO. MW1 LOCATION Sik 9  
 WEATHER CONDITIONS hot, humid, sunny AMBIENT TEMP: ~85°F  
 PERSONNEL P. Lay, J. Smith  
 REVIEWED BY: D. F. J. J.

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? See logbook  
 Which well was previously purged? Sik 9 MW1

SAMPLING DEVICE metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH + metal  
 How was the device decontaminated? DI water → peristaltic pump → DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P9MW2GW4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Slickup (ft.) ~2'  
 Depth to bottom of well (ft.) BDC 31.85  
 Depth to water surface (ft.) BDC 18.54  
 Length of water (ft.) 13.31  
 Volume of water (ft<sup>3</sup>) —  
 (gal.) 2.1  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1043 Finished 1057  
 Volume purged 9 gallons  
 Comments on Well Recovery none  
 Additional Comments pH meter may be drifting, pH readings are suspect  
 Samples Collected: Start 1530 Finish 1548  
1545

IN-SITU TESTING	Date: <u>8/27/93</u>						
	Time: <u>1043</u>	<u>1046</u>	<u>1049</u>	<u>1054</u>	<u>1057</u>	<u>1530</u>	<u>7</u>
Water Level <u>ft BDC</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>18.53</u>	
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>8</u>	
Turbidity	<u>clear</u>	<u>v. turbid</u>	<u>v. turbid</u>	<u>v. turbid</u>	<u>sl. turbid</u>	<u>clear/turbid</u>	
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	
<u>H<sub>2</sub>S</u> Organic Vapor (ppm)	<u>0</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	
pH (units)	<u>7.84</u>	<u>8.81</u>	<u>8.90</u>	<u>9.40</u>	<u>9.14</u>	<u>4</u>	
Conductivity ( $\mu$ mhos)	<u>488</u>	<u>4.56</u>	<u>4.90</u>	<u>4.81</u>	<u>5.12</u>	<u>413</u>	
Water Temperature ( $^{\circ}$ F)	<u>63.9</u>	<u>60.8</u>	<u>58.4</u>	<u>58.9</u>	<u>78.6</u>	<u>58.7</u>	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-83

BDC = Below Top of (Outer steel) casing

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: PMW54W4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931800-12</u>		DATE: <u>8/27/93</u>	
WELL NO. <u>NW2</u>		LOCATION <u>Site 9</u>			
WEATHER CONDITIONS <u>hot, humid, calm, sunny</u> AMBIENT TEMP: <u>~80°F</u>					
PERSONNEL <u>P. Lay + J. Smith</u>					
REVIEWED BY: <u>D. Taylor</u>					
EQUIPMENT USED: <u>Peristaltic pump &amp; disposable polyethylene hose; teflon bailer with disposable nylon cord</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Peristaltic Pump</u>			Type Device? <u>teflon bailer for VOCs, SVOCs, TPH</u>		
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>DI water + alconox → DI water → methanol; air dry</u>		
How was the line decontaminated? <u>see logbook</u>			How was the line decontaminated? <u>disposable new nylon cord used each time</u>		
Which well was previously purged? <u>Site 9 MW5</u>			Which well was previously sampled? <u>PMW54W4</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>0949</u> Finished <u>1000</u>		
Stickup (ft.) <u>~2'</u>			Volume purged <u>6</u> gallons		
Depth to bottom of well (ft.) <u>BTC</u> <u>33.77</u>			Comments on Well Recovery <u>none</u>		
Depth to water surface (ft.) <u>BTC</u> <u>25.12</u>			Additional Comments <u>none</u>		
Length of water (ft.) <u>8.65</u>			Samples Collected: Start <u>1418</u> Finish <u>1445</u>		
Volume of water (ft <sup>3</sup> ) <u>—</u>			Amount of sediment at bottom of well (ft.) <u>NM</u>		
(gal.) <u>1.3</u>			LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>		
IN-SITU TESTING					
Date:	<u>8/27/93</u>				
Time:	<u>0949</u>	<u>0952</u>	<u>0953</u>	<u>0955</u>	<u>0956</u>
Water Level # <u>BTC</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Turbidity	<u>clear</u>	<u>v. turbid</u>	<u>v. turbid</u>	<u>v. turbid</u>	<u>v. turbid</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>0</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>3.88</u>	<u>4.20</u>	<u>4.05</u>	<u>4.40</u>	<u>4.63</u>
Conductivity (μ mhos)	<u>7.85</u>	<u>7.98</u>	<u>8.29</u>	<u>8.46</u>	<u>8.71</u>
Water Temperature (°F)	<u>61.8</u>	<u>55.0</u>	<u>53.8</u>	<u>53.9</u>	<u>54.3</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal Turbidity choices: clear, turbid, opaque 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal Revision Date: 2-6-91					

3  
8.65  
0.16  
51.90  
8650  
128.40

1.3 gal  
x 3 wells  
3.9 gallons  
in 3 well volumes  
(minimum)

HNW

Just prior to sampling

>

just after sampling

TETC134

NM = Not Measured

G-84

BTC = Below Top of (Outer steel) Casing

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P9 MW 3C W4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/27/93  
 WELL NO. MW3 LOCATION Sik 9  
 WEATHER CONDITIONS hot, sunny, humid, slight breeze AMBIENT TEMP: 85 °F  
 PERSONNEL J Smith & P Lay  
 REVIEWED BY: DFT

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? See logbook  
 Which well was previously purged? MW1 Sik 9

SAMPLING DEVICE metals & peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH, metals  
 How was the device decontaminated? DI water & nitrox → DI water → methanol, air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? \_\_\_\_\_

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BOC 5.68  
 Depth to water surface (ft.) BOC 15.31  
 Length of water (ft.) 17.37  
 Volume of water (ft<sup>3</sup>) 0.288  
 (gal.) 17  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1141 Finished 1154  
 Volume purged 8 gallons  
 Comments on Well Recovery \_\_\_\_\_  
 Additional Comments \_\_\_\_\_  
pH meter is drifting (using pH paper as well)  
 Samples Collected: Start 1640  
1650 Finish 1650

IN-SITU TESTING	Date: <u>8/27/93</u>					
	Time:	<u>1141</u>	<u>1144</u>	<u>1148</u>	<u>1151</u>	<u>1154</u>
Water Level # BOC		<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>15.33</u>
Well Volume Purged (gal.)		<u>0</u>	<u>2</u>	<u>4.5</u>	<u>6</u>	<u>8</u>
Turbidity		<u>clear</u>	<u>turbid</u>	<u>turbid</u>	<u>turbid</u>	<u>SL</u>
Odor		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)		<u>0</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)		<u>8.5(7)</u>	<u>8.4(7)</u>	<u>9.8(7)</u>	<u>9.4(7)</u>	<u>9.54(7)</u>
Conductivity (µ mhos)		<u>433</u>	<u>468</u>	<u>514</u>	<u>433</u>	<u>428</u>
Water Temperature (°F)		<u>65.4</u>	<u>57.9</u>	<u>59.5</u>	<u>57.9</u>	<u>57.4</u>

Notes: 1 ft. length of 4" = 0.007 ft<sup>3</sup> or 0.05 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC134

NM = Not Measured

G-85

BOC = Below Top of (outer steel) casing

FIGURE 3-2

8.5(7)  
pH meter  
pH paper

# GROUNDWATER SAMPLING

Sample ID: P9mw4 Gw4

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/8/93</u>																																																																																	
WELL NO. <u>mw4</u>		LOCATION <u>Site 9 Radar Tower proposed location.</u>																																																																																			
WEATHER CONDITIONS <u>cool, cloudy</u>		AMBIENT TEMP: <u>~60°F</u>																																																																																			
PERSONNEL <u>PLCay and BF Noeton</u>																																																																																					
REVIEWED BY: <u>DFS</u>																																																																																					
EQUIPMENT USED: <u>Bailer, rope, pump assembly, filter</u>																																																																																					
<b>PURGING DEVICE</b> <u>PHL</u> Type Device? <u>Pump &amp; Bailer</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously purged? <u>P2mw5 Resample</u>			<b>SAMPLING DEVICE</b> Type Device? <u>Bailer</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously sampled? <u>P2mw5 Resample</u>																																																																																		
<b>INITIAL WELL VOLUME</b> Well diameter (in.) <u>2"</u> Stickup (ft.) <u>~2'</u> Depth to bottom of well (ft.) <u>32.29' BTOC</u> Depth to water surface (ft.) <u>20.63' BTOC</u> Length of water (ft.) <u>11.66</u> Volume of water (ft <sup>3</sup> ) <u>0.256</u> (gal.) <u>1.865</u> Amount of sediment at bottom of well (ft.) <u>-</u> LNAPL (ft.) _____ DNAPL (ft.) _____			<b>PURGING</b> Time started <u>0850</u> Finished <u>0910</u> Volume purged <u>9</u> Comments on Well Recovery <u>Immediate</u> Additional Comments _____ Samples Collected: Start <u>1045</u> Finish <u>1100</u>																																																																																		
<b>IN-SITU TESTING</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Date: <u>9/8/93</u></th> <th><u>9/8/93</u></th> <th><u>9/8/93</u></th> <th><u>9/8/93</u></th> <th><u>9/8/93</u></th> <th><u>9/8/93</u></th> <th><u>9/8/93</u></th> </tr> </thead> <tbody> <tr> <td>Time:</td> <td><u>0850</u></td> <td><u>0855</u></td> <td><u>0858</u></td> <td><u>0900</u></td> <td><u>0905</u></td> <td><u>0910</u></td> <td><u>1100</u></td> </tr> <tr> <td>Water Level</td> <td><u>20.63</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>20.64</u></td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>initial</u></td> <td><u>2</u></td> <td><u>4</u></td> <td><u>6</u></td> <td><u>8</u></td> <td><u>9</u></td> <td><u>-</u></td> </tr> <tr> <td>Turbidity</td> <td><u>none</u></td> <td><u>sl.</u></td> <td><u>mod</u></td> <td><u>very</u></td> <td><u>very</u></td> <td><u>mod</u></td> <td><u>mod</u></td> </tr> <tr> <td>Odor</td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>pH (units)</td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td><u>352</u></td> <td><u>328</u></td> <td><u>323</u></td> <td><u>332</u></td> <td><u>318</u></td> <td><u>323</u></td> <td><u>348</u></td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>52.4</u></td> <td><u>50.6</u></td> <td><u>50.1</u></td> <td><u>50.3</u></td> <td><u>50.2</u></td> <td><u>50.2</u></td> <td><u>51.2</u></td> </tr> </tbody> </table>							Date: <u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	Time:	<u>0850</u>	<u>0855</u>	<u>0858</u>	<u>0900</u>	<u>0905</u>	<u>0910</u>	<u>1100</u>	Water Level	<u>20.63</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>20.64</u>	Well Volume Purged (gal.)	<u>initial</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>9</u>	<u>-</u>	Turbidity	<u>none</u>	<u>sl.</u>	<u>mod</u>	<u>very</u>	<u>very</u>	<u>mod</u>	<u>mod</u>	Odor	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	pH (units)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	Conductivity (µ mhos)	<u>352</u>	<u>328</u>	<u>323</u>	<u>332</u>	<u>318</u>	<u>323</u>	<u>348</u>	Water Temperature (°C)	<u>52.4</u>	<u>50.6</u>	<u>50.1</u>	<u>50.3</u>	<u>50.2</u>	<u>50.2</u>	<u>51.2</u>
	Date: <u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>																																																																														
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Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal Turbidity choices: clear, turbid, opaque 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal Revision Date: 2-8-91																																																																																					

TETC154

# GROUNDWATER SAMPLING

Sample ID: P9MWSGW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/26/93  
 WELL NO. MW5 LOCATION Site 9  
 WEATHER CONDITIONS partly cloudy, humid, calm AMBIENT TEMP: -80°F  
 PERSONNEL J. Smith & P. Lay  
 REVIEWED BY: DFJ

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Peristaltic Pump</u>	Type Device? <u>metals → peristaltic pump</u>
How was the device decontaminated? <u>see logbook</u>	How was the device decontaminated? <u>DI water + allonox → DI water → methanol; air dry</u>
How was the line decontaminated? <u>see logbook</u>	How was the line decontaminated? <u>disposable new nylon cord used each time</u>
Which well was previously purged? <u>Site 6 MW3</u>	Which well was previously sampled? <u>P6 MW 3 GW 4</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>1547</u> Finished <u>1658</u>
Stickup (ft.) <u>~2'</u>	Volume purged <u>16 gallons</u>
Depth to bottom of well (ft.) BTOC <u>53.65</u>	Comments on Well Recovery
Depth to water surface (ft.) BTOC <u>21.57</u>	Additional Comments <u>* PH meter is drifting; all readings are suspect</u>
Length of water (ft.) <u>32.08</u>	
Volume of water (ft <sup>3</sup> ) <u>0.7</u>	
(gal.) <u>5.13</u>	
Amount of sediment at bottom of well (ft.) <u>NM</u>	Sample Collected: Start <u>1659</u>
LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>	1715 Finish <u>1717</u>

IN-SITU TESTING	Date:	8/26/93					
	Time:	1547	1619	1635	1650	1659	1717
Water Level ft BTOC		21.57	21.61	21.62	21.61	21.53	NM
Well Volume Purged (gal.)		0	5	10	15		16
Turbidity		clear	clear	clear	clear		clear
Odor		none	none	none	none		none
Organic Vapor (ppm)		NM	NM	NM	NM		NM
pH (units)		8.00	10.85	9.87	9.31		9.47
Conductivity (μ mhos)		683	666	588	580		624
Water Temperature (°F)		74.5	65.9	62.6	62.6		61.4

Notes: 1 ft. length of 4" = 0.007 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.18 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC134

NM = Not Measured

G-87

BTOC = Below Top of (Outer steel) Casing

FIGURE 3-2

## GROUNDWATER SAMPLING

Sample ID: P9MWLGW4

PROJECT NAME <u>Phelps Collins ANG RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/14/93</u>	
WELL NO. <u>MW6</u>		LOCATION <u>Site 9 RT</u>			
WEATHER CONDITIONS <u>Cooling, Rainy</u>		AMBIENT TEMP: <u>80°F</u>			
PERSONNEL <u>PHLay EDAJ</u>					
REVIEWED BY: <u>JSB</u>					
EQUIPMENT USED: <u>Bailer, rope, hand pump assembly filter</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>		
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>Wetox+DL, DL rinse</u>		
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>		
Which well was previously purged? <u>Pgmw5 exposure</u>			Which well was previously sampled? _____		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started: <u>2037</u> Finished <u>2100</u>		
Stickup (ft.) <u>-0.3</u>			Volume purged <u>6 gallons</u>		
Depth to bottom of well (ft.) <u>23.35</u>			Comments on Well Recovery <u>immediate</u>		
Depth to water surface (ft.) <u>14.44</u>			Additional Comments _____		
Length of water (ft.) <u>8.91</u>			_____		
Volume of water (ft <sup>3</sup> ) <u>0.196</u>			_____		
(gal.) <u>1.425</u>			Samples Collected: Start <u>1335</u>		
Amount of sediment at bottom of well (ft.) <u>-</u>			Finish <u>1350</u>		
LNAPL (ft.) <u>-</u>			_____		
DNAPL (ft.) <u>-</u>			_____		
IN-SITU TESTING					
Date:	<u>9/14/93</u>	<u>9/14/93</u>	<u>9/14/93</u>	_____	_____
Time:	<u>2037</u>	<u>2048</u>	<u>2100</u>	_____	_____
Water Level	<u>14.44</u>	_____	<u>14.44</u>	_____	_____
Well Volume Purged (gal.)	<u>-</u>	<u>3</u>	<u>6</u>	_____	_____
Turbidity	<u>none</u>	<u>sl.</u>	<u>mod</u>	_____	_____
Odor	<u>mod</u>	<u>strong</u>	<u>strong</u>	_____	_____
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	_____	_____
pH (units)	<u>unable to calibrate</u>			_____	_____
Conductivity ( $\mu$ mhos)	<u>pH and conductivity</u>			_____	_____
Water Temperature (°C)	<u>58.5°F</u>	<u>58.1</u>	<u>59.5</u>	_____	_____
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal. Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91					

## Appendix H: Surveying Data



# R. S. Scott Associates, Inc.

ARCHITECTS. ENGINEERS. SURVEYORS

405 RIVER STREET  
ALPENA, MICHIGAN 49707  
(517) 354-3178

November 4, 1987

W.O. 4-7347

ELEV.			ELEV.			
RT9 - MW1	=	691.00	SF5 - MW1	=	681.03	P.W. #1 - Conc. Floor
RT9 - MW2	=	692.85	SF5 - MW2	=	681.29(a)	Directly opposite well on
RT9 - MW3	=	685.50	SF5 - MW3	=	682.27	West Side = 683.10
RT9 - MW4	=	687.77	SF5 - MW4	=	681.97	
RT9 - MW5	=	687.85	SF5 - SB1	=	677.95	P.W. #2 - Conc. Floor
RT9 - SB1	=	691.27	SF5 - SB2	=	677.85	Directly North of well
RT9 - SB2	=	689.87	SF5 - SB3	=	680.05	casing = 685.43
RT9 - SB3	=	685.57	SF5 - SB4	=	678.95	
RT9 - SB4	=	687.01				P.W. #3 - Top of casing
RT9 - SB5	=	685.71	LF6 - MW1	=	690.54	with cap on = 680.16
RT9 - SB6	=	688.81	LF6 - MW2	=	685.01	
			LF6 - MW3	=	687.14	P.W. #4 - Conc. Floor
CG3 - MW1	=	687.96	FF7 - SB1	=	683.74	West Side = 693.59
CG3 - MW2	=	694.41	FF7 - SB2	=	682.64	
CG3 - MW3	=	690.01	FF7 - SB3	=	684.34	P.W. #5 - Top of well cas
CG3 - MW4	=	694.13	FF7 - SB4	=	682.54	under cap = 681.35
CG3 - MW5	=	694.26				
CG3 - SB1	=	691.92	Spring #1	=	649.66	P.W. #6 - Well appears to
CG3 - SB2	=	691.72	Spring #2	=	649.78	under trailer - trailer
CG3 - SB3	=	692.22	Spring #3	=	644.19	floor at bathroom door
CG3 - SB4	=	692.02	Spring #7	=	646.23	= 681.51
CG3 - SB5	=	691.92	Spring #8	=	646.19	
CG3 - SB6	=	692.02				
CG3 - SB7	=	692.72	TF4 - MW1	=	690.24	Staff Gauge #1 = 674.42
CG3 - SB8	=	692.32	TF4 - MW2	=	688.63	Staff Gauge #2 = 672.65
CG3 - SB9	=	691.82	TF4 - MW3	=	685.00	Staff Gauge #3 = 673.42
CG3 - SB10	=	692.02	TF4 - MW4	=	686.14	Staff Gauge #4 = 673.08
			TF4 - SB1	=	686.23	Staff Gauge #5 = 673.21
HN8 - MW1	=	687.15	TF4 - SB2	=	686.33	Staff Gauge #6 = 642.51
HN8 - MW2	=	693.00	TF4 - SB3	=	686.43	
HN8 - MW3	=	693.65	TF4 - SB4	=	686.23	
HN8 - MW4	=	693.75				
HN8 - SB1	=	690.27				
			Galvanized Pipe Wells			
MP2 - MW1	=	684.63	#1	=	680.19	
MP2 - MW2	=	683.87	#2	=	680.13	
MP2 - SB1	=	682.56	#3	=	681.17	
MP - MW3	=	683.43	#4	=	678.10	
MP - MW4	=	683.59	#5	=	680.65	
MP - MW5	=	683.47	#6	=	681.77	
			#7	=	682.44	

Staff gauges 1-6 did not exist as of July 1993  
JSS 6/14/95

Staff gauges 1-6 did not  
exist on 6 July 1993  
JSS 6/14/95

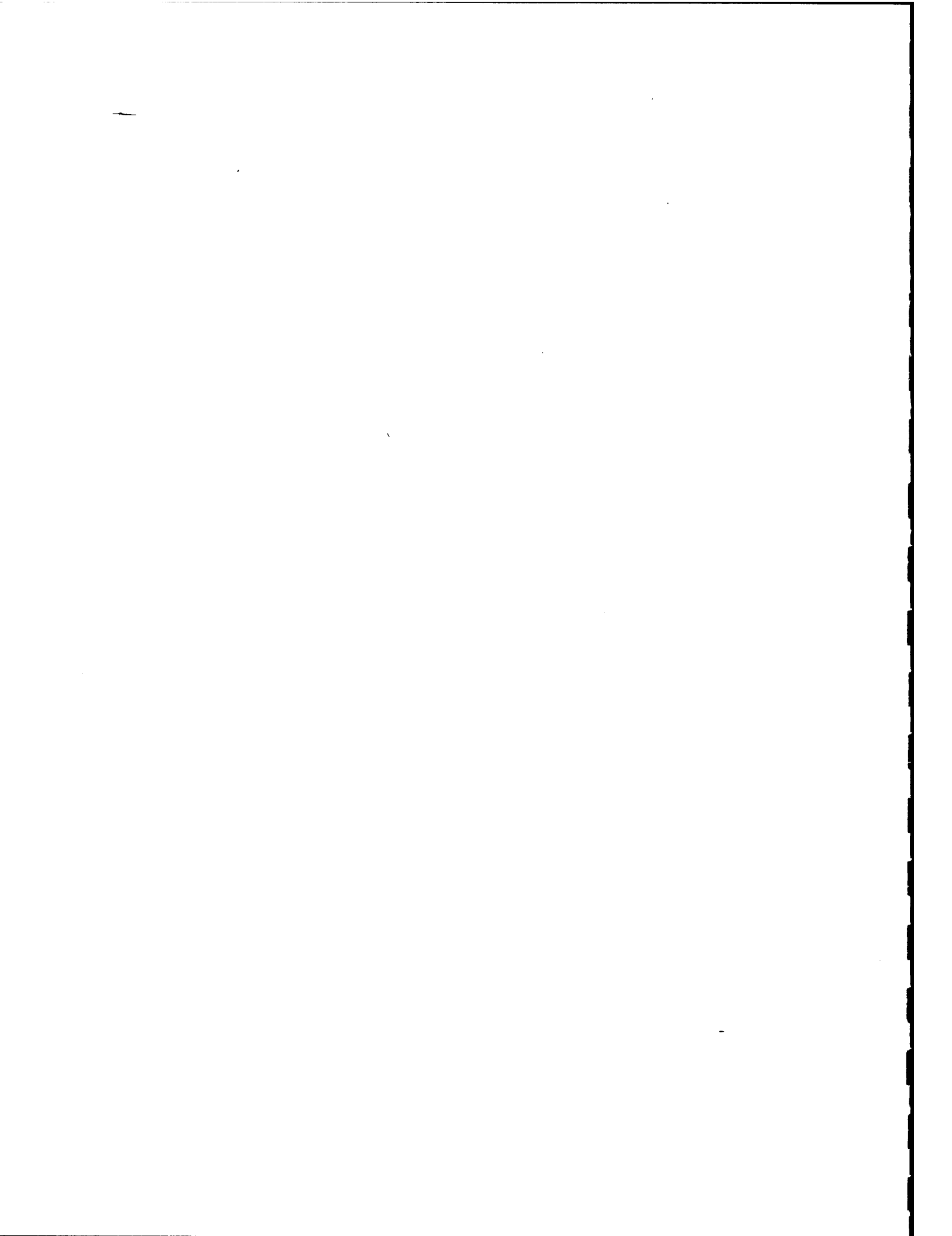
NOTE: Elevations as shown were taken at the following locations:  
Monitoring Wells: Top of the rim, inside next to the hasp.  
Soil Borings: Ground surface at the boring location.  
Springs: At the water discharge point.  
Galvanized Pipe Wells: Top of casing below the cap.  
Staff Gauges: Top of the nail at the gauge.

August 23, 1988

	<u>ELEV.</u>
SF5 - MW2	= 680.31
Staff Gauge #6	= 634.46

- (a) Well and staff gauge were repaired in August 1988 due to damage.  
R.S. Scott shot new elevations in August 1988.

## **Surveying Data - August 1993**



IDENTIFICATION NUMBER	REFERENCE POINT TYPE			EAST COORDINATE	NORTH (Y) COORDINATE	ELEVATION (Z) COORDINATE	
	VEIL	SOIL BORING	OTHER			GROUND	ROD
SIW1	X			18224.98	15843.11	678.6	678.23
SIW2	X			18398.47	15431.11	681.8	681.16
SIW3	X			18267.71	15084.96	681.0	680.55
SIW4	X			18359.24	15875.88	679.3	678.94
SIW5	X			18045.17	15408.50		
SIW6	X			18078.39	15717.59	677.2	679.28
SIW11	X			17823.93	15389.00	676.1	677.74
SIW12	X			18169.08	15949.70	678.3	680.20
SIW13	X			18045.33	15421.99	678.0	680.27
SIW14	X			18299.83	15377.91	678.6	679.18
SIP21			PEIZOMETER	18132.60	15386.60	679.3	679.06
SIP72			PEIZOMETER	18366.38	15773.28	679.6	678.34
SIP73			PEIZOMETER	18369.31	15184.00	678.4	
SIS84		X		18247.68	15185.39	680.7	
SIS85		X		18188.20	15284.29	678.5	
SIS86		X		18300.10	15289.43	678.7	
SIS87		X		18088.90	15489.70	678.9	
SIS88		X		18193.58	15480.24	680.2	
SIS89		X		18244.70	15574.21	678.8	
SIS910		X		18331.07	15583.39	679.71	
SIS911		X		18315.98	15752.54	678.0	
SIS912		X		18407.33	15780.24	678.3	
SIS913		X		18177.83	15844.00	682.9	682.62
MP2M1	X			18664.42	15676.93	681.6	683.78
MP2M2	X			18089.82	16301.46	681.3	683.18
MP2M3	X			18902.92	16708.65	681.4	683.44
MP2M4	X			18902.95	16188.32	681.3	683.39
MP2M5	X			18038.02	16585.46	683.1	682.85
MP2M6	X			19255.95	18092.98	683.1	682.79
MP2M7	X			18080.24	16115.91	683.3	
MP2S82		X		19157.12	16108.92	683.3	
MP2S83		X		18370.53	16085.84	683.4	
MP2S84		X		19287.27	16073.03	683.4	
MP2S85		X		18091.18	15850.30	682.6	
MP2S86		X		18979.30	15675.17	682.1	
MP2S87		X		19035.60	15784.71	682.3	
MP2S88		X		19281.44	16051.20	683.4	
MP2S89		X		20322.51	15856.35	685.7	687.87
CG3M1	X			19865.45	16309.88	692.0	694.30
CG3M2	X			19528.94	16008.16	687.9	688.80
CG3M3	X			18657.11	16335.78	692.0	694.00
CG3M4	X			18887.87	16441.48	693.0	694.00

3-H : D. R. MacNEILL & ASSOC  
 3-H : D. R. MacNEILL & ASSOC  
 3-H : D. R. MacNEILL & ASSOC  
 3-H : D. R. MacNEILL & ASSOC



IDENTIFICATION NUMBER	REFERENCE POINT TYPE			EAST (X) COORDINATE	NORTH (Y) COORDINATE	ELEVATION (Z) COORDINATE	
	WELL	SOIL BORING	OTHER			GROUND	EDM
LF6UW5	X			17902.45	20034.28	881.8	883.71
LF6UW6	X			18257.52	18417.45	685.3	687.18
LF6UW7	X			17855.84	19828.03	684.1	686.00
LF6UW8	X			19745.18	17984.81	682.9	685.01
LF6UW9	X			18858.79	17950.27	682.3	684.21
LF6UW10	X			17743.08	20075.35	680.7	682.70
HN6UW1	X			20424.46	16241.29	687.3	687.11
HN6UW2	X			20170.26	17021.30	680.6	682.91
HN6UW3	X			20101.13	16583.59	691.4	683.47
HN6UW4	X			20089.64	16388.20	691.6	683.84
HN6UW5	X			20317.55	18880.22	687.8	687.49
HN6SB2	X	X		20390.58	16478.64	688.3	
HN6SB3		X		20321.60	16459.88	688.4	
HN6SB4		X		20180.38	18618.05	689.9	
HN6SB5		X		20334.88	18358.34	688.3	
HN6SB6		X		20188.28	16433.67	691.2	
HN6SB7		X		20186.87	16381.80	690.7	
HN6SB8		X		20390.31	18381.25	688.4	
RT9UW1	X			20224.38	17920.04	688.9	690.79
RT9UW2	X			18887.73	18432.03	690.5	692.63
RT9UW3	X			18545.58	18122.35	683.2	685.22
RT9UW4	X			18673.73	18430.34	685.4	687.52
RT9UW5	X			18886.42	18428.12	685.3	687.81
RT9UW6	X			18675.51	18138.87	685.3	685.00
RT9UW7			TEST WELL	18672.55	18244.83	686.1	
RT9UW8			TEST WELL	18685.52	17813.68	685.7	
RT9SB13		X		19887.45	17778.80	688.9	
SPRING #1			SPRING	19933.14	19214.74	651.2	
SPRING #2			SPRING	18584.35	19272.79	651.1	
SPRING #3			SPRING	18570.00	19361.67	648.7	
SPRING #4			SPRING	18516.17	19185.88	651.6	
SPRING #5			SPRING	19474.84	19172.83	652.5	
SPRING #6			SPRING	18388.53	19284.41	649.7	
B.M. IN 7" ASH			BENCHMARK	17878.98	20153.49		675.04
B.M. IN 20" WHITE PINE STUMP			BENCHMARK	17816.97	15505.52		674.72
B.M. IN 6" WHITE BIRCH			BENCHMARK	18581.73	19342.21		651.31
USGS COLLINS #1			BENCHMARK	20331.88	16706.53		688.56

\* B4 staff gauge # 3 (Site 6+7) 6/14/95  
 \* B4 staff gauge # 4 (Site 1) 6/14/95-150  
 \* Benchmark in sinkhole; used to determine elevation for staff gauge # 3 in sinkhole JSB 6/14/95  
 \* These are the only existing JSB 6/14/95

\* Staff gauge elevations are provided on Table B-1; do to for the staff gauges reference



H 109423

STATE OF MICHIGAN  
DEPARTMENT OF COMMERCE  
BOARD OF PROFESSIONAL SURVEYORS  
PROFESSIONAL SURVEYOR  
LICENSE

JOHN ENGLER  
GOVERNOR

DUANE R MAC NEILL  
432 RIPLEY BLVD  
ALPENA MI 49707

THIS DOCUMENT IS DULY  
ISSUED UNDER THE LAWS OF  
THE STATE OF MICHIGAN.

PERMANENT ID. NO. 4001014237  
EXPIRATION DATE 10/31/95  
2515177

Collins 1956

PCR NGS 16 FEB 95

NAO 27  $\phi$  45 04 50.23900  
h 83 33 56.18500  
NAP 83  $\phi$  45 04 50.28171  
h 83 33 56.11395

Collins 1956 RM 1  
 $\phi$  45 04 50.  
h 83 33 56

AP 1966 STA B SCALED  
 $\phi$  45 07 02  
h 83 33 58

ARP 1966 SCALED.  
 $\phi$  45 07 18  
h 87 38 04

Nancy.

301-713-3242 NGS info line  
CD Rom 50<sup>00</sup> (13 states)  
5<sup>1/4</sup> or 3<sup>1/2</sup> @ 30<sup>00</sup> By County.

JANUARY 1973

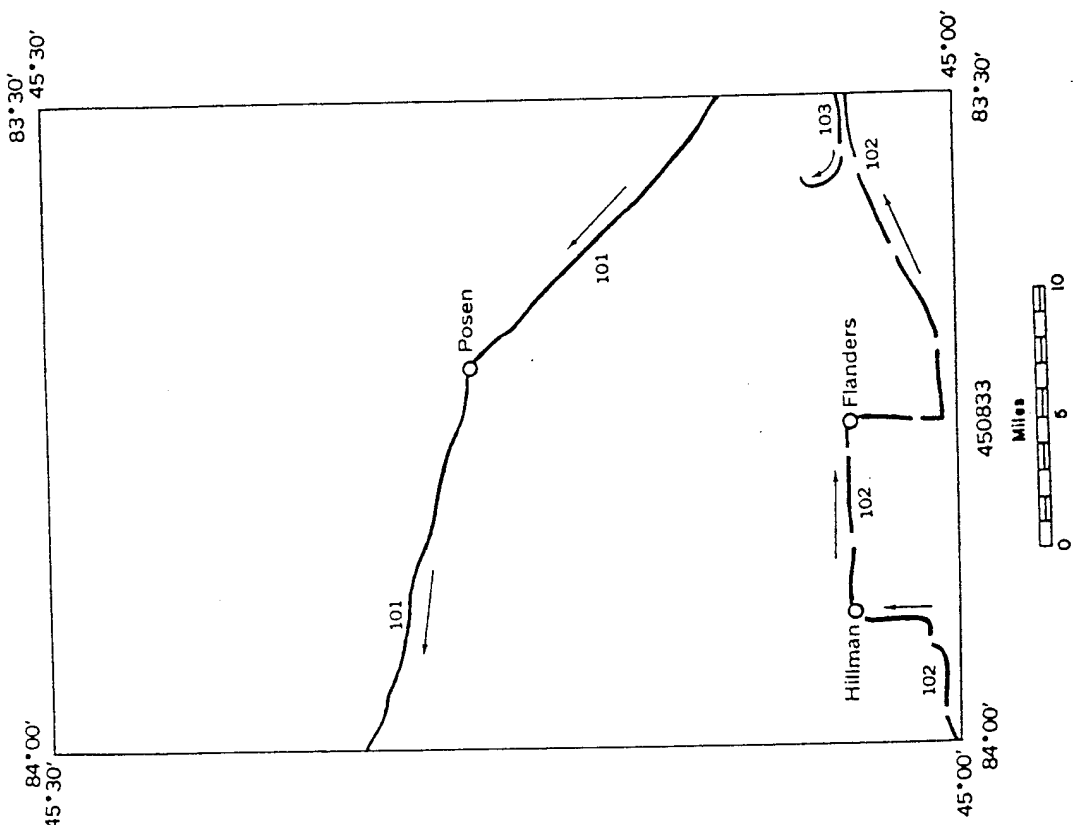
U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

# VERTICAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
SEA LEVEL DATUM OF 1929

QUAD - - - - - 150033  
HIGHLAND  
LATITUDE 45° 00' 45° 30'  
LONGITUDE 84° 00' 84° 30'  
DIAGRAM ALPHA NL 17-7

*0.2*



USCOMNA-NOAA-ASHEVILLE

REPLACES EARLIER LISTS

QUAD 450853  
 HIGHTMAN  
 LATITUDE  
 LONGITUDE  
 DIAGONAL

# VERTICAL CONTROL DATA

by the  
 NATIONAL GEODETIC SURVEY  
 SEA-LEVEL DATUM OF 1929

JANUARY 1973  
 U.S. DEPARTMENT OF COMMERCE  
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
 NATIONAL OCEAN SURVEY  
 REPLACES ELEV. OF MARCH 1962

## LINE 101

ADJUSTMENT OF 1929 HZ L-2380

M. M. Gibson 1934 FIRST-ORDER

BENCH MARK	ADJUSTED ELEVATION (Meters)	ADJUSTED ELEVATION (Feet)
HW 25 (DM HY)	214.633	704.175
Q 36	215.119	705.770
R 36	DESTROYED	
S 36	DESTROYED	
T 36	220.695	724.064
U 36	228.424	749.421
RV 26 (DM HY)	239.258	784.966
Y 36	248.902	816.606
Z 36	DESTROYED	
A 37	DESTROYED	
RV 27 (DM HY)	247.043	810.507
B 37	255.887	839.523
C 37	DESTROYED	

## LINE 102

ADJUSTMENT OF 1940 HZ L-2384

M. M. Gibson 1934 SECOND-ORDER

BENCH MARK	ADJUSTED ELEVATION (Meters)	ADJUSTED ELEVATION (Feet)
Z 79	258.181	847.049
C 80	237.483	779.142
D 80	221.022	725.136
E 80	232.169	761.708
F 80	233.520	766.140
J 80	226.083	741.741
L 80	207.755	681.610
M 80	201.151	659.943

## LINE 103

HZ L-20817

ADJUSTMENT OF 1966

E. T. Ogilby 8-11-66 8-19-66 SECOND-ORDER

BENCH MARK	ADJUSTED ELEVATION (Meters)	ADJUSTED ELEVATION (Feet)
C 183	192.816	632.597
D 183	202.191	663.555
E 183	203.664	668.188
AP 1966 STA A	207.530	680.215
P 183	209.887	687.948
COLLINS	209.720	688.056
COLLINS RM 1	209.875	688.558
COLLINS RM 2	210.107	689.326
ARP 1966	208.983	679.077

JANUARY 1973

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

VERTICAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
SEA LEVEL DATUM OF 1929

QUAD 450833 PAGE NO. 5  
MICHIGAN 45° 00' 45" 30"  
LATITUDE 87° 30' 00" 00"  
LONGITUDE ALPENA MI 17-7  
DIAGRAM LINE 103

DESCRIPTION OF BENCH MARK

Designation AP 1966 STA A State Michigan County Alpena  
Nearest town Alpena Chief of party E.T.O.  
Distance and direction from nearest town 6.5 mi. west Leveling date August 1966  
Character of mark Standard topographic mark Stamping AP 1966 STA A  
Established by USCGS  
Detailed description

The station is located at Phelps Collins Airport 175.0 ft east of the intersection of the centerline of runway end 36 and the end of the overrun. It is a standard topographic disk set in the top of a concrete post and is stamped "AP 1966 STA A".

LINE 103

DESCRIPTION OF BENCH MARK

Designation C 183 State Michigan County Alpena  
Nearest town Alpena Chief of party E.T.O.  
Distance and direction from nearest town 3.0 miles west Leveling date August 1966  
Character of mark Standard disk Stamping C 183 1966  
Established by USCGS  
Detailed description

The mark is located 3.0 miles west of the intersection of State Highway 32 and the Detroit & Mackinac Railroad tracks at the intersection of State Highway 32 and Walter Street 0.9 mile west of B 183 and 1.25 miles east of D 183, 90 feet west of the centerline of Walter Street, and 34 feet north of the centerline of State Highway 32. The mark is a standard disk stamped "C 183 1966" set in the top of a 9-inch concrete post 3 feet and 1 foot lower than the road.

DESCRIPTION OF BENCH MARK

Designation D 183 State Michigan County Alpena  
Nearest town Alpena Chief of party E.T.O.  
Distance and direction from nearest town 4.2 miles west Leveling date August 1966  
Character of mark Standard disk Stamping D 183 1966  
Established by USCGS  
Detailed description

The mark is located 3.2 miles west of the intersection of State Highway 32 and the Detroit & Mackinac Railroad tracks, 1.25 miles west of C 183, 0.85 mile east of E 183, on the property of the F. Wako Small Animal Clinic, 74 feet south of the centerline of State Highway 32, 22 feet west of the centerline of the driveway to the clinic, and 3 feet west of a guyed power pole. It is a standard disk stamped "D 183 1966" set in top of a 9-inch concrete post flush with the ground and is about two feet higher than the highway.

DESCRIPTION OF BENCH MARK

Designation E 183 State Michigan County Alpena  
Nearest town Alpena Chief of party E.T.O.  
Distance and direction from nearest town 5.0 miles west Leveling date August 1966  
Character of mark Standard disk Stamping E 183 1966  
Established by USCGS  
Detailed description

The mark is located 4.0 miles west of the intersection of State Highway 32 and the Detroit & Mackinac Railroad tracks, 0.8 miles west of D 183, and about 6000 feet east of the north-south runway extended. The mark is at the northeast corner of the intersection of W-32 with a 1-road to the right, and is on U.S. Government property. It is 77 feet north of the centerline of W-32, 10 feet east of the centerline of a dirt road, 2 feet north of a corner fence post, 65 feet west of a tall hemlock tree, and 44 feet southeast of power pole number 20. The mark is 4 feet lower than the highway, set in a 9 inch concrete post projecting 2 inches above the ground. It is a standard disk stamped "E 183 1966". Described: B.A.T.

1973 JAN 12 127

DESCRIPTION OF BENCH MARK

Designation F 183 State Michigan County Alpena  
Nearest town Alpena Chief of party E.T.O.  
Distance and direction from nearest town 6.3 miles west Leveling date August 1966  
Character of mark Standard disk Stamping F 183 1966  
Established by USCGS  
Detailed description

The mark is located at Phelps Collins Airport in the center of the lawn on the east side of the terminal and Weather Bureau building. It is set in the top of a 9 inch concrete post flush with the ground. The mark is 10 feet north of the edge of the south walkway from the terminal, 7 feet west of the airplane parking area and a wire fence, 26.5 feet east of the east face of the terminal, and 11 feet north of the middle walkway from the terminal. Described: B.A.T.

DESCRIPTION OF BENCH MARK

Designation COLLINS State Michigan County Alpena  
Nearest town Alpena Chief of party E.T.O.  
Distance and direction from nearest town 6.5 mi. west Leveling date August 1966  
Character of mark Standard triangulation disk Stamping COLLINS 1966  
Established by USCGS  
Detailed description

The mark is located 6.5 miles west of Alpena, on Phelps Collins Airport at the intersection of 3rd Street and East Avenue, 108 feet southeast of the intersection, 64 feet southeast of the southwest corner of Building 1-10, 35 feet west of a witness post, 34 feet east of the center of 3rd Street, and 20.5 feet west of the southwest leg of the beacon tower. It is a standard disk set in a concrete post flush with the ground and is stamped "COLLINS 1966." Described: BAS

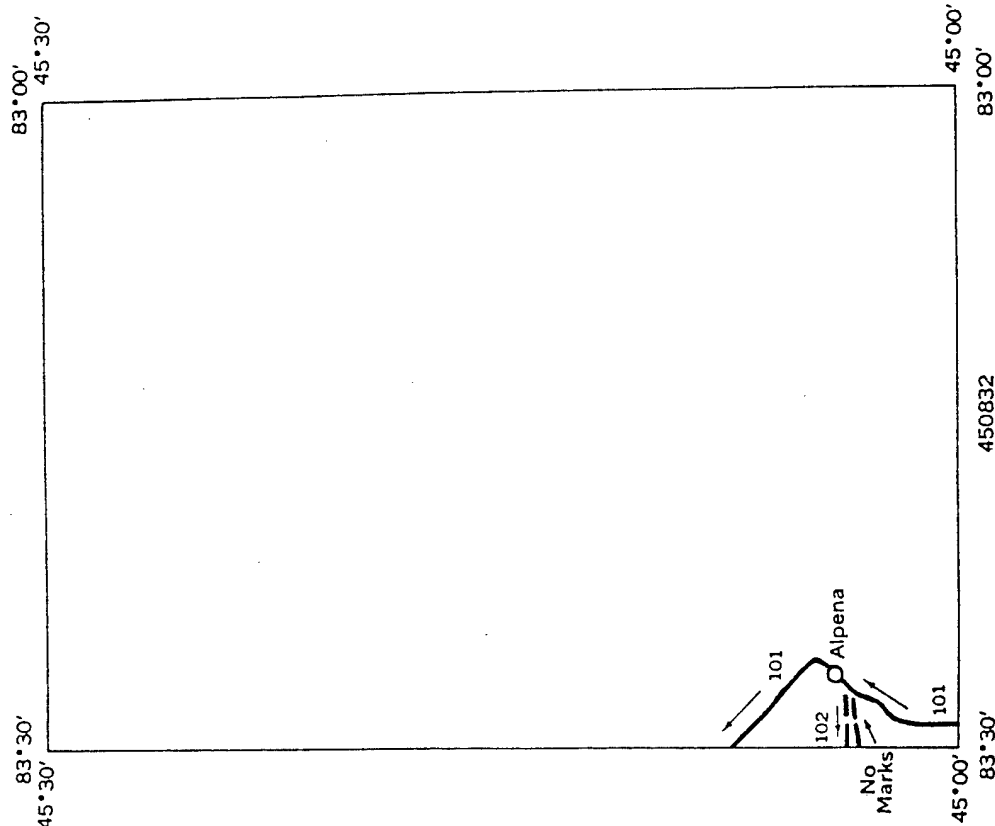
JANUARY 1973

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

# VERTICAL CONTROL DATA

By the  
NATIONAL GEODETIC SURVEY  
SEA LEVEL DATUM OF 1929

QUAD-----150832  
MICHIGAN  
LATITUDE 45°00' to 45°30'  
LONGITUDE 83°00' to 83°30'  
DIAGRAM ALPENA ILL 17-7



REPLACES EARLIER LIST

USCOMM-NOAA-ASHEVILLE

JANUARY 1973

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY  
REPLACES ELEV. OF APRIL 1962

# VERTICAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
SEA-LEVEL DATUM OF 1929

QUAD 450832 PAGE 110 1  
MICHIGAN 45°00' to 45°30'  
LATITUDE 83°00' to 83°30'  
LONGITUDE ALPENA  
DIAGRAM HL 17-7

## LINE 101

ADJUSTMENT OF 1929		HQZ L-2350	
W. M. Gibson 1934		SECOND ORDER	
BENCH MARK	ADJUSTED ELEVATION		
H 36	189.878	622.958	
J 36	190.251	624.182	
K 36		DESTROYED	
L 36		DESTROYED	

ADJUSTMENT OF 1966		HQZ L-20817	
E. T. Ogilby 8-11-66 9-19-66		SECOND ORDER	
BENCH MARK	ADJUSTED ELEVATION		
M 36	184.972	606.862	
PIRE LDMK 1941	180.595	592.502	
(USLS)		NOT RECOVERED	
PH		DESTROYED	
LIBRARY (USLS)			
PO (USLS)	180.325	591.616	

## LINE 102

ADJUSTMENT OF 1966		HQZ L-20817	
E. T. Ogilby 8-11-66 9-19-66		SECOND ORDER	
BENCH MARK	ADJUSTED ELEVATION (METERS)		
A 183	185.722	602.761	
B 183	194.552	638.293	

JANUARY 1973

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

# VERTICAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
SEA LEVEL DATUM OF 1929

QUAD 450832 PAGE 110.3  
MICHIGAN to 45°30'  
LATITUDE to 83°30'  
LONGITUDE 83°00'  
DIAGRAM ALPEHA  
LINE 102

LINE 102

## SPUR LINE TO PHELPS COLLINS AIRPORT

### DESCRIPTION OF BENCH MARK

Designation A 183  
Nearest town Alpena  
Distance and direction from nearest town At Alpena  
Character of mark Standard disk  
Established by CGCS  
Detailed description

The mark is located 0.2 mile west of the intersection of State Highway 32 and the Detroit & Macinec Railroad tracks in the center of a grass island in a Michigan State Highway rest area. The mark is 94 feet southwest of the center of three 4-foot willow trees, 88 feet west of the centerline of S. Eleventh Street, 85.5 feet south of a drinking fountain, 61 feet east of a blazed maple tree, and 44 feet north of the centerline of State Highway 32. It is a standard disk set in top of a 9-inch concrete post flush with the ground and stamped "A 183 1966".  
The mark is 0.7 mile southwest of H 36 and 0.85 mile east of B 183.

### DESCRIPTION OF BENCH MARK

Designation B 183  
Nearest town Alpena  
Distance and direction from nearest town 2.0 miles west  
Character of mark Standard disk  
Established by CGCS  
Detailed description

The mark is located 2.0 miles west of Alpena along State Highway 32, 0.85 mile west of A 183, 0.9 mile east of C 183 in the southwest 2X2' concrete guy anchor for the WATZ radio antenna, 179 feet north of the centerline of State Highway 32, 70 feet west of the west face of WATZ radio station building. The mark is a standard disk stamped "B 183 1966" set in the top of the anchor projecting 6 inches and is about 5 feet higher than the highway.

SPUR LINE CONTINUES INTO QUAD 450833

B. 11:

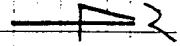
This might be gone by now  
we have a new B.M. set by a  
Power Pole in front of All Phone  
Elec. I don't have the information  
here at Alpena at the present time  
I will get it by the first of next  
week and pass it on to you.  
Copy B.M. included  
C.L.F. New Included

Bm 183 RESET 1991

17LPENR

Elev. 636.238

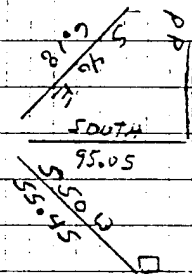
M-32



All Phase

BLDG

SE Cor 4' Cont Walk



1/589

SE Cor  
50' x  
SIDW post

BAGLEY ST

C. Lindgren  
Dist. #4 Surveyor



**Appendix I: Analytical Results; Investigation Derived  
Wastes - Decontamination Water and Soil Cuttings**



# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
CAYCE, SOUTH CAROLINA 29033  
(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Project Name: Phelp Collins A&G

Attention: JEAN MCKEE

SHEALY Lab No: 44079R  
Description: PPT5002

Coll. Date: 08/23/93  
Coll. Time: 1420

Date Received: 08/24/93  
Date Reported: 08/30/93  
Date Revised: 08/31/93  
\* Extraction Date 08/25/93  
\*\* Blank depletions >0.50 mg/l

QA/QC Officer YMBE

Parameters	Result	Units	%Spike Recovery	Analyst	Date Analyzed
BOD5-Total	**138	mg/l		KAB	08/25/93
TPH 418.1	<5.0	mg/l		MDE	08/24/93
TSS	10	mg/l		RLB	08/24/93
METALS					
Antimony	<0.020	mg/l	116.0	FT	08/27/93
Arsenic	<0.050	mg/l	97.0	FT	08/27/93
Beryllium	<0.005	mg/l	95.0	FT	08/27/93
Cadmium	<0.005	mg/l	94.0	FT	08/27/93
Chromium	0.036	mg/l	93.0	FT	08/27/93
Copper	<0.010	mg/l	97.0	FT	08/27/93
Lead	<0.020	mg/l	106.0	FT	08/27/93
Mercury	<0.001	mg/l		FT	08/27/93
Nickel	<0.005	mg/l	93.0	FT	08/27/93
Selenium	<0.050	mg/l	100.0	FT	08/27/93
Silver	<0.005	mg/l	99.0	FT	08/27/93
Thallium	<0.100	mg/l	95.0	FT	08/27/93
Zinc	<0.005	mg/l	94.0	FT	08/27/93
VOLATILE ORGANICS METHOD 624				YY	08/24/93
Benzene	<5.0	ug/l	106.0		
Bromochloromethane	<5.0	ug/l			
Bromodichloromethane	<5.0	ug/l			
Bromoform	<5.0	ug/l			
Bromomethane	<10.0	ug/l			
2-Butonane (MEK)	<5.0	ug/l			
Carbon tetrachloride	<5.0	ug/l			
Chlorobenzene	<5.0	ug/l	103.0		
Chloroethane	<10.0	ug/l			
2-Chloroethylvinylether	<5.0	ug/l			
Chloroform	<5.0	ug/l			

Chloromethane	<10.0	ug/l			
Dibromochloromethane	<5.0	ug/l			
1,2-Dibromoethane (EDB)	<5.0	ug/l			
1,2-Dichlorobenzene	<5.0	ug/l			
1,3-Dichlorobenzene	<5.0	ug/l			
1,4-Dichlorobenzene	<5.0	ug/l			
Dichlorodifluoromethane	<10.0	ug/l			
1,1-Dichloroethane	<5.0	ug/l			
1,2-Dichloroethane	<5.0	ug/l			
1,1-Dichloroethene	<5.0	ug/l	99.0		
trans-1,2-Dichloroethene	<5.0	ug/l			
1,2-Dichloropropane	<5.0	ug/l			
cis-1,3-Dichloropropene	<5.0	ug/l			
trans-1,3-Dichloropropene	<5.0	ug/l			
Diisopropylether (IPE)	<5.0	ug/l			
Ethyl benzene	<5.0	ug/l			
Methylene chloride	<5.0	ug/l			
Methyl tertiary butyl ether	<5.0	ug/l			
1,1,2,2-Tetrachloroethane	<5.0	ug/l			
Tetrachloroethene	<5.0	ug/l			
Toluene	<5.0	ug/l	105.0		
1,1,1-Trichloroethane	<5.0	ug/l			
1,1,2-Trichloroethane	<5.0	ug/l			
Trichloroethene	<5.0	ug/l	107.0		
Trichlorofluoromethane	<10.0	ug/l			
Vinyl chloride	<10.0	ug/l			
Total Xylenes	<12.0	ug/l			
Acetonitrile	<100	ug/l		YY	08/24/93
bis(Chloromethyl)ether	<20000	ug/l		YY	08/24/93
ACID EXTRACTABLES *				JAB	08/26/93
4-Chloro-3-methylphenol	<10.0	ug/l	65.1		
2-Chlorophenol	<10.0	ug/l	59.8		
2,4-Dichlorophenol	<10.0	ug/l			
2,4-Dimethylphenol	<10.0	ug/l			
4,6-Dinitro-2-methylphenol	<20.0	ug/l			
2,4-Dinitrophenol	<50.0	ug/l			
2-Nitrophenol	<10.0	ug/l			
4-Nitrophenol	<10.0	ug/l	35.5		
Pentachlorophenol	<10.0	ug/l	50.6		
Phenol	<10.0	ug/l	34.0		
2,4,6-Trichlorophenol	<10.0	ug/l			
BASE NEUTRAL EXTRACTABLES *				JAB	08/26/93
Acenaphthene	<10.0	ug/l	51.6		
Acenaphthylene	<10.0	ug/l			
Anthracene	<10.0	ug/l			
Azobenzene	<10.0	ug/l			
Benzidine	<10.0	ug/l			
Benzo(a)anthracene	<10.0	ug/l			
Benzo(b+k)fluoranthene	<20.0	ug/l			
Benzo(g,h,i)perylene	<10.0	ug/l			
Benzo(a)pyrene	<10.0	ug/l			
bis(2-Chloroethoxy)methane	<10.0	ug/l			
bis(2-Chloroethyl)ether	<10.0	ug/l			
bis(2-Chloroisopropyl)ether	<10.0	ug/l			
bis(2-Ethylhexyl)phthalate	<10.0	ug/l			
4-Bromophenylphenylether	<10.0	ug/l			
Butylbenzylphthalate	<10.0	ug/l			

## Parameters

Result

Units

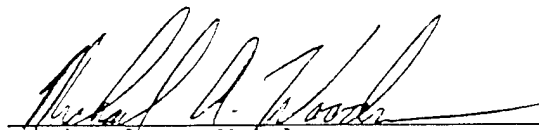
%Spike  
Recovery

Analyst

Date  
Analyzed

Parameters	Result	Units	%Spike Recovery	Analyst	Date Analyzed
2-Chloronaphthalene	<10.0	ug/l			
4-Chlorophenylphenylether	<10.0	ug/l			
Chrysene	<10.0	ug/l			
p-Cresol	<10.0	ug/l			
o-Cresol	<10.0	ug/l			
Dibenzo(a,h)anthracene	<10.0	ug/l			
1,2-Dichlorobenzene	<10.0	ug/l			
1,3-Dichlorobenzene	<10.0	ug/l			
1,4-Dichlorobenzene	<10.0	ug/l	56.3		
3,3'-Dichlorobenzidine	<10.0	ug/l			
Diethylphthalate	<10.0	ug/l			
Dimethylphthalate	<10.0	ug/l			
di-N-Butylphthalate	<10.0	ug/l			
2,4-Dinitrotoluene	<10.0	ug/l	59.4		
2,6-Dinitrotoluene	<10.0	ug/l			
di-N-Octylphthalate	<10.0	ug/l			
Fluoranthene	<10.0	ug/l			
Fluorene	<10.0	ug/l			
Hexachlorobenzene	<10.0	ug/l			
Hexachlorobutadiene	<10.0	ug/l			
Hexachlorocyclopentadiene	<10.0	ug/l			
Hexachloroethane	<10.0	ug/l			
Indeno(1,2,3-c,d)pyrene	<10.0	ug/l			
Isophorone	<10.0	ug/l			
Naphthalene	<10.0	ug/l			
Nitrobenzene	<10.0	ug/l			
N-Nitrosodimethylamine	<10.0	ug/l			
N-Nitrosodi-N-propylamine	<10.0	ug/l	60.2		
N-Nitrosodiphenylamine	<10.0	ug/l			
Phenanthrene	<10.0	ug/l			
Pyrene	<10.0	ug/l	51.3		
1,2,4-Trichlorobenzene	<10.0	ug/l	53.7		

Reported by:

  
 Michael A. Woodrum  
 Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
CAYCE, SOUTH CAROLINA 29033  
(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-


Project Name: Hazwrap-Phelps Collins Ang

Attention: PATRICK LAY

SHEALY Lab No: 44434R  
Description: PPT003


Coll. Date: 08/31/93  
Coll. Time: 1530

Date Received: 09/02/93  
Date Reported: 09/07/93

QA/QC Officer 

Parameters	Result	Units	Analyst	Date Analyzed
TPH 418.1	<5.0	mg/l	MDE	09/07/93

Reported by:

  
Michael A. Woodrum  
Vice President of Analytical Services

## SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS &amp; CHEMISTS

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Page: 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

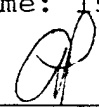
Project Name: Hazwrap-Phelps Collins Ang

Attention: PATRICK LAY

SHEALY Lab No: 44435R  
Description: PPT003

Coll. Date: 08/31/93  
Coll. Time: 1530

Date Received: 09/02/93  
Date Reported: 09/07/93

QA/QC Officer 

Ext Date 09/02/93  
\* Blank read <10.0 ug/l

Parameters	Result	Units	Analyst	Date Analyzed
ACID EXTRACTABLES			JAB	09/03/93
4-Chloro-3-methylphenol	<10.0	ug/l		
2-Chlorophenol	<10.0	ug/l		
2,4-Dichlorophenol	<10.0	ug/l		
2,4-Dimethylphenol	<10.0	ug/l		
4,6-Dinitro-2-methylphenol	<20.0	ug/l		
2,4-Dinitrophenol	<50.0	ug/l		
2-Nitrophenol	<10.0	ug/l		
4-Nitrophenol	<20.0	ug/l		
Pentachlorophenol	<10.0	ug/l		
Phenol	<20.0	ug/l		
2,4,6-Trichlorophenol	<10.0	ug/l		
BASE NEUTRAL EXTRACTABLES			JAB	09/03/93
Acenaphthene	<10.0	ug/l		
Acenaphthylene	<10.0	ug/l		
Anthracene	<10.0	ug/l		
Azobenzene	<10.0	ug/l		
Benzidine	<10.0	ug/l		
Benzo(a)anthracene	<10.0	ug/l		
Benzo(b+k)fluoranthene	<20.0	ug/l		
Benzo(g,h,i)perylene	<10.0	ug/l		
Benzo(a)pyrene	<10.0	ug/l		
bis(2-Chloroethoxy)methane	<10.0	ug/l		
bis(2-Chloroethyl)ether	<10.0	ug/l		
bis(2-Chloroisopropyl)ether	<20.0	ug/l		
bis(2-Ethylhexyl)phthalate	*998	ug/l		
4-Bromophenylphenylether	<10.0	ug/l		
Butylbenzylphthalate	<10.0	ug/l		
2-Chloronaphthalene	<10.0	ug/l		
4-Chlorophenylphenylether	<10.0	ug/l		

Chrysene	<10.0	ug/l		
Dibenzo(a,h)anthracene	<10.0	ug/l		
1,2-Dichlorobenzene	<10.0	ug/l		
1,3-Dichlorobenzene	<10.0	ug/l		
1,4-Dichlorobenzene	<10.0	ug/l		
3,3'-Dichlorobenzidine	<10.0	ug/l		
Diethylphthalate	<10.0	ug/l		
Dimethylphthalate	<10.0	ug/l		
di-N-Butylphthalate	<10.0	ug/l		
2,4-Dinitrotoluene	<10.0	ug/l		
2,6-Dinitrotoluene	<10.0	ug/l		
di-N-Octylphthalate	*43.1	ug/l		
Fluoranthene	<10.0	ug/l		
Fluorene	<10.0	ug/l		
Hexachlorobenzene	<10.0	ug/l		
Hexachlorobutadiene	<10.0	ug/l		
Hexachlorocyclopentadiene	<10.0	ug/l		
Hexachloroethane	<10.0	ug/l		
Indeno(1,2,3-c,d)pyrene	<10.0	ug/l		
Isophorone	<10.0	ug/l		
Naphthalene	<10.0	ug/l		
Nitrobenzene	<10.0	ug/l		
N-Nitrosodimethylamine	<20.0	ug/l		
N-Nitrosodi-N-propylamine	<10.0	ug/l		
N-Nitrosodiphenylamine	<10.0	ug/l		
Phenanthrene	<10.0	ug/l		
Pyrene	<10.0	ug/l		
1,2,4-Trichlorobenzene	<10.0	ug/l		
m+p-Cresol	<20.0	ug/l		
o-Cresol	<10.0	ug/l		

Reported by: Mark D. Edwards for  
Michael A. Woodrum  
Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

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## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964

Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Project Name: Hazwrap-Phelps Collins Ang

Attention: PATRICK LAY

SHEALY Lab No: 44436R  
Description: PPT003

Coll. Date: 08/31/93  
Coll. Time: 1530

Date Received: 09/02/93  
Date Reported: 09/04/93

QA/QC Officer

Parameters	Result	Regulatory Limit	Units	%Spike Recovery	Analyst	Date Analyzed
METALS					FT	09/02/93
Antimony	<0.020		mg/l	86.0		
Arsenic	<0.050		mg/l	106.0		
Beryllium	<0.005		mg/l	95.0		
Cadmium	<0.005		mg/l	90.0		
Chromium	0.026		mg/l	94.0		
Copper	0.015		mg/l	91.0		
Lead	<0.050		mg/l	101.0		
Nickel	<0.005		mg/l	91.0		
Selenium	<0.050		mg/l	99.0		
Silver	<0.005		mg/l	86.0		
Thallium	<0.100		mg/l	99.0		
Zinc	<0.005		mg/l	94.0		

Reported by:

*Mark D. Edwards for*  
Michael A. Woodrum  
Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
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## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-


Project Name: Hazwrap-Phelps Collins Ang

Attention: PATRICK LAY

SHEALY Lab No: 44437R  
Description: PPT003

Coll. Date: 08/31/93  
Coll. Time: 1530

Date Received: 09/02/93  
Date Reported: 09/07/93

QA/QC Officer 

\* BOD received out of holding time, not analyzed per client.

Parameters	Result	Units	Analyst	Date Analyzed
BOD5-Total	*	mg/l		
TSS	20	mg/l	RLB	09/03/93

Reported by: Mark A. Edwards for  
Michael A. Woodrum  
Vice President of Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

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## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
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TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-


Project Name: Hazwrap-Phelps Collins Ang

Attention: PATRICK LAY

SHEALY Lab No: 44438R  
Description: PPT003

Coll. Date: 08/31/93  
Coll. Time: 1530

Date Received: 09/02/93  
Date Reported: 09/07/93

QA/QC Officer 

Parameters	Result	Units	Analyst	Date Analyzed
VOLATILE ORGANICS METHOD 624			YY	09/02/93
Benzene	<5.0	ug/l		
Bromochloromethane	<5.0	ug/l		
Bromodichloromethane	<5.0	ug/l		
Bromoform	<5.0	ug/l		
Bromomethane	<10.0	ug/l		
2-Butonane (MEK)	<5.0	ug/l		
Carbon tetrachloride	<5.0	ug/l		
Chlorobenzene	<5.0	ug/l		
Chloroethane	<10.0	ug/l		
2-Chloroethylvinylether	<5.0	ug/l		
Chloroform	<5.0	ug/l		
Chloromethane	<10.0	ug/l		
Dibromochloromethane	<5.0	ug/l		
1,2-Dibromoethane (EDB)	<5.0	ug/l		
1,2-Dichlorobenzene	<5.0	ug/l		
1,3-Dichlorobenzene	<5.0	ug/l		
1,4-Dichlorobenzene	<5.0	ug/l		
Dichlorodifluoromethane	<10.0	ug/l		
1,1-Dichloroethane	<5.0	ug/l		
1,2-Dichloroethane	<5.0	ug/l		
1,1-Dichloroethene	<5.0	ug/l		
trans-1,2-Dichloroethene	<5.0	ug/l		
1,2-Dichloropropane	<5.0	ug/l		
cis-1,3-Dichloropropene	<5.0	ug/l		
trans-1,3-Dichloropropene	<5.0	ug/l		
Diisopropylether (IPE)	<5.0	ug/l		
Ethyl benzene	<5.0	ug/l		

Methylene chloride	<5.0	ug/l		
Methyl tertiary butyl ether (MTBE)	<5.0	ug/l		
Naphthalene	<5.0	ug/l		
1,1,2,2-Tetrachloroethane	<5.0	ug/l		
Tetrachloroethene	<5.0	ug/l		
Toluene	<5.0	ug/l		
1,1,1-Trichloroethane	<5.0	ug/l		
1,1,2-Trichloroethane	<5.0	ug/l		
Trichloroethene	<5.0	ug/l		
Trichlorofluoromethane	<10.0	ug/l		
Vinyl chloride	<10.0	ug/l		
Total Xylenes	<12.0	ug/l		
Acrolein	<50.0	ug/l		
Acrylonitrile	<50.0	ug/l		
Acetonitrile	<100	ug/l		
bis(Chloromethyl) ether	<20000	ug/l		

Reported by: Mark D. Edwards for  
Michael A. Woodrum  
Vice President of Analytical Services

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## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Project Name: PHELPS COLLINS ANG CRTIC RI

Attention: PATRICK LAY

SHEALY Lab No: 45203  
Description: P10002

Coll. Date: 09/15/93  
Coll. Time: 2108

Date Received: 09/17/93  
Date Reported: 10/06/93

QA/QC Officer MAC

\*Ext Date 09/21/93  
\*\*bis(2-Ethylhexyl)phthalate <10.0 ug/l in blank

Parameters	Result	Units	Analyst	Date Analyzed
BOD5-Total	27	mg/l	RLB	09/17/93
TPH 418.1	<5.00	mg/l	MDE	09/22/93
TSS	445	mg/l	RLB	09/21/93
METALS				
Antimony	<0.020	mg/l	FT	10/05/93
Arsenic	0.090	mg/l	FT	10/05/93
Beryllium	<0.010	mg/l	FT	10/05/93
Cadmium	<0.010	mg/l	FT	10/05/93
Chromium	<0.020	mg/l	FT	10/05/93
Copper	0.187	mg/l	FT	10/05/93
Lead	0.337	mg/l	FT	10/05/93
Mercury	<0.001	mg/l	FT	09/29/93
Nickel	<0.010	mg/l	FT	10/05/93
Selenium	<0.050	mg/l	FT	10/05/93
Silver	<0.005	mg/l	FT	10/05/93
Thallium	<0.500	mg/l	FT	10/05/93
Zinc	0.370	mg/l	YY	09/17/93
VOLATILE ORGANICS METHOD 624				
Benzene	<5.0	ug/l		
Bromochloromethane	<5.0	ug/l		
Bromodichloromethane	<5.0	ug/l		
Bromoform	<5.0	ug/l		
Bromomethane	<10.0	ug/l		
2-Butonane (MEK)	<5.0	ug/l		
Carbon tetrachloride	<5.0	ug/l		
Chlorobenzene	<5.0	ug/l		
Chloroethane	<10.0	ug/l		
2-Chloroethylvinylether	<5.0	ug/l		
Chloroform	<5.0	ug/l		

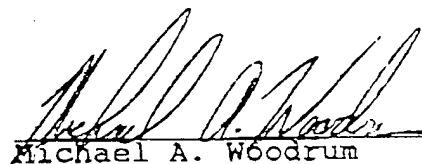
## Parameters

Result Units Analyst Date Analyzed

Parameters	Result	Units	Analyst	Date Analyzed
Chloromethane	<10.0	ug/l		
Dibromochloromethane	<5.0	ug/l		
1,2-Dibromoethane (EDB)	<5.0	ug/l		
1,2-Dichlorobenzene	<5.0	ug/l		
1,3-Dichlorobenzene	<5.0	ug/l		
1,4-Dichlorobenzene	<5.0	ug/l		
Dichlorodifluoromethane	<10.0	ug/l		
1,1-Dichloroethane	<5.0	ug/l		
1,2-Dichloroethane	<5.0	ug/l		
1,1-Dichloroethene	<5.0	ug/l		
trans-1,2-Dichloroethene	<5.0	ug/l		
1,2-Dichloropropane	<5.0	ug/l		
cis-1,3-Dichloropropene	<5.0	ug/l		
trans-1,3-Dichloropropene	<5.0	ug/l		
Diisopropylether (IPE)	<5.0	ug/l		
Ethyl benzene	<5.0	ug/l		
Methylene chloride	<5.0	ug/l		
Methyl tertiary butyl ether (MTBE)	<5.0	ug/l		
Naphthalene	<5.0	ug/l		
1,1,2,2-Tetrachloroethane	<5.0	ug/l		
Tetrachloroethene	<5.0	ug/l		
Toluene	<5.0	ug/l		
1,1,1-Trichloroethane	<5.0	ug/l		
1,1,2-Trichloroethane	<5.0	ug/l		
Trichloroethene	<5.0	ug/l		
Trichlorofluoromethane	<10.0	ug/l		
Vinyl chloride	<10.0	ug/l		
Total Xylenes	<12.0	ug/l		
Acetonitrile	<100	ug/l		
bis(Chloromethyl) ether	<20000	ug/l		
ACID EXTRACTABLES *			JAB	09/28/93
4-Chloro-3-methylphenol	<10.0	ug/l		
2-Chlorophenol	<10.0	ug/l		
2,4-Dichlorophenol	<10.0	ug/l		
2,4-Dimethylphenol	<10.0	ug/l		
4,6-Dinitro-2-methylphenol	<20.0	ug/l		
2,4-Dinitrophenol	<10.0	ug/l		
2-Nitrophenol	<10.0	ug/l		
4-Nitrophenol	<10.0	ug/l		
Pentachlorophenol	<10.0	ug/l		
Phenol	<10.0	ug/l		
2,4,6-Trichlorophenol	<10.0	ug/l		
BASE NEUTRAL EXTRACTABLES *			JAB	09/28/93
Acenaphthene	<10.0	ug/l		
Acenaphthylene	<10.0	ug/l		
Anthracene	<10.0	ug/l		
Azobenzene	<10.0	ug/l		
Benzidine	<10.0	ug/l		
Benzo(a)anthracene	<10.0	ug/l		
Benzo(b+k)fluoranthene	<20.0	ug/l		
Benzo(g,h,i)perylene	<10.0	ug/l		
Benzo(a)pyrene	<10.0	ug/l		
bis(2-Chloroethoxy)methane	<10.0	ug/l		
bis(2-Chloroethyl) ether	<10.0	ug/l		
bis(2-Chloroisopropyl) ether	<10.0	ug/l		
bis(2-Ethylhexyl)phthalate	**33.4	ug/l		
4-Bromophenylphenylether	<10.0	ug/l		

	Result	Units	Analyst	Date Analyzed
Butylbenzylphthalate	<10.0	ug/l		
2-Chloronaphthalene	<10.0	ug/l		
4-Chlorophenylphenylether	<20.0	ug/l		
Chrysene	<10.0	ug/l		
Dibenzo(a,h)anthracene	<10.0	ug/l		
1,2-Dichlorobenzene	<10.0	ug/l		
1,3-Dichlorobenzene	<10.0	ug/l		
1,4-Dichlorobenzene	<10.0	ug/l		
3,3'-Dichlorobenzidine	<10.0	ug/l		
Diethylphthalate	<20.0	ug/l		
Dimethylphthalate	<10.0	ug/l		
di-N-Butylphthalate	<10.0	ug/l		
2,4-Dinitrotoluene	<10.0	ug/l		
2,6-Dinitrotoluene	<10.0	ug/l		
di-N-Octylphthalate	<10.0	ug/l		
Fluoranthene	<10.0	ug/l		
Fluorene	<10.0	ug/l		
Hexachlorobenzene	<10.0	ug/l		
Hexachlorobutadiene	<10.0	ug/l		
Hexachlorocyclopentadiene	<10.0	ug/l		
Hexachloroethane	<10.0	ug/l		
Indeno(1,2,3-c,d)pyrene	<10.0	ug/l		
Isophorone	<10.0	ug/l		
Naphthalene	<10.0	ug/l		
Nitrobenzene	<10.0	ug/l		
N-Nitrosodimethylamine	<10.0	ug/l		
N-Nitrosodi-N-propylamine	<10.0	ug/l		
N-Nitrosodiphenylamine	<20.0	ug/l		
Phenanthrene	<10.0	ug/l		
Pyrene	<10.0	ug/l		
1,2,4-Trichlorobenzene	<10.0	ug/l		
m+p-Cresol	<20.0	ug/l		
o-Cresol	<10.0	ug/l		

Reported by:

  
Michael A. Woodrum  
Vice President of Analytical Services



## **TCLP Analytical Results for Soil Cuttings**



## SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS &amp; CHEMISTS

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## CERTIFICATE OF ANALYSIS

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Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Attention: Jean McKee

SHEALY Lab No: 45146  
Description: DECON

Coll. Date: 09/13/93  
Coll. Time: 1836

Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer CMJ

Parameters	Regulatory		Units	Analyst	Date Analyzed
	Result	Limit			
TCLP METALS					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.419	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	0.039	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.002	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
TCLP VOLATILES				YY	09/23/93
Benzene	<0.10	0.5	mg/l		
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
TCLP SEMIVOLATILES				JAB	09/22/93
m+p-Cresol	<0.020	200.0	mg/l		
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:



Michael A. Woodrum

Vice President Analytical Services

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Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Attention: Jean McKee

SHEALY Lab No: 45147  
Description: LF6MW8

Coll. Date: 09/13/93  
Coll. Time: 1912

Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer

*CMF*

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
<b>TCLP METALS</b>					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.614	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
<b>TCLP VOLATILES</b>					
Benzene	<0.10	0.5	mg/l	YY	09/23/93
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
<b>TCLP SEMIVOLATILES</b>					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/22/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:



Michael A. Woodrum  
Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
CAYCE, SOUTH CAROLINA 29033  
(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Attention: Jean McKee

SHEALY Lab No: 45148  
Description: S1COMP

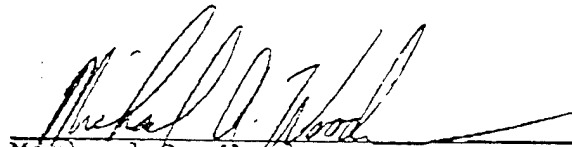
Coll. Date: 09/13/93  
Coll. Time: 2000

Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer CMJ

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
<b>TCLP METALS</b>					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.319	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
<b>TCLP VOLATILES</b>					
Benzene	<0.10	0.5	mg/l	YY	09/23/93
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
<b>TCLP SEMIVOLATILES</b>					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/22/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:



Michael A. Woodrum  
Vice President Analytical Services

## SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS &amp; CHEMISTS

106 VANTAGE POINT DRIVE  
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(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103

NC DEM NO. 329

VA VDH-DWSE NO. 00303

TN DHE NO. 2964

Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Attention: Jean McKee

SHEALY Lab No: 45149  
Description: SF5MW8

Coll. Date: 09/13/93  
Coll. Time: 1905

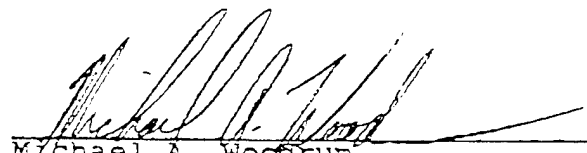
Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer

*cmf*

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
TCLP METALS					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.629	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
TCLP VOLATILES				YY	09/23/93
Benzene	<0.10	0.5	mg/l		
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
TCLP SEMIVOLATILES				JAB	09/22/93
m+p-Cresol	<0.020	200.0	mg/l		
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:



Michael A. Woodrum  
Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
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## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 929  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Attention: Jean McKee

SHEALY Lab No: 45150  
Description: RT9MW6

Coll. Date: 09/13/93  
Coll. Time: 1930


Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer

*CMJ*

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
<b>TCLP METALS</b>					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.346	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
<b>TCLP VOLATILES</b>					
Benzene	<0.10	0.5	mg/l	YY	09/23/93
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
<b>TCLP SEMIVOLATILES</b>					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/22/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:

  
\_\_\_\_\_  
Michael A. Woodrum  
Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
CAYCE, SOUTH CAROLINA 29033  
(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26105  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2864

Page 1

**Client:** EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

**Attention:** Jean McKee

SHEALY Lab No: 45151  
Description: C63PZ1

Coll. Date: 09/13/93  
Coll. Time: 1948

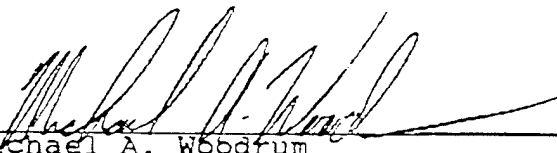
Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer CMF

\* Pentachlorophenol <0.020 mg/l in blank

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
<b>TCLP METALS</b>					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.319	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
<b>TCLP VOLATILES</b>					
Benzene	<0.10	0.5	mg/l	YY	09/24/93
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
<b>TCLP SEMIVOLATILES</b>					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/23/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	*0.182	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:



Michael A. Woodrum  
Vice President Analytical Services

## SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS &amp; CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
CAYCE, SOUTH CAROLINA 29033  
(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964

Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Attention: Jean McKee

SHEALY Lab No: 45152  
Description: MP2SB5

Coll. Date: 09/14/93  
Coll. Time: 0745

Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer

*CMJ*

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
TCLP METALS					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.351	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
TCLP VOLATILES					
Benzene	<0.010	0.5	mg/l	YY	09/24/93
Carbon tetrachloride	<0.010	0.5	mg/l		
Chlorobenzene	<0.010	100.0	mg/l		
Chloroform	<0.010	6.0	mg/l		
1,4-Dichlorobenzene	<0.010	7.5	mg/l		
1,2-Dichloroethane	<0.010	0.5	mg/l		
1,1-Dichloroethene	<0.010	0.7	mg/l		
Methyl ethyl ketone	<0.010	200.0	mg/l		
Tetrachloroethene	<0.010	0.7	mg/l		
Trichloroethene	<0.010	0.5	mg/l		
Vinyl chloride	<0.020	0.2	mg/l		
TCLP SEMIVOLATILES					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/22/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:



Michael A. Woodrum  
Vice President Analytical Services